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(NASA-CR-145360) MODIFICATIONS TO THE
WDTVOR AND VORTWD COMPUTER PROGRAMS FOR
CONVERTING INPUT DATA BETWEEN VORLAX AND
WAVE DRAG INPUT FORMATS (Vought Corp.,
Hampton, Va.) 110 p HC A06/MF A01 CSCL 09E G3/61

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MODIFICATIONS TO THE WDTVOR AND VORTWD COMPUTER
PROGRAMS FOR CONVERTING INPUT DATA BETWEEN
VORLAX AND WAVE DRAG INPUT FORMATS

By

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an LTV Company

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For

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MODIFICATIONS TO THE WDTVOR AND VORTWD COMPUTER
PROGRAMS FOR CONVERTING INPUT DATA BETWEEN
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By Glenn L. Martin

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SUMMARY

Two computer programs, WDTVOR and VORTWD, have been developed by the Lockheed California Company to convert input data between wave drag and VORLAX input formats. Both programs have been modified to include the capability of converting multi-segment fuselage data. The capability of converting VORLAX geometric data to wave drag format without camber as well as with camber has also been added to the VORTWD program. Listings of the original program, the modifications, and the modified program are included for both programs.

INTRODUCTION

The input data for the VORLAX program consists primarily of geometric data describing the configuration. Many aerodynamic analysis programs at Langley Research Center use an input format called wave drag. The Lockheed California Company has developed two programs: (1) WDTVOR to convert data from wave drag format to VORLAX format and (2) VORTWD to convert from VORLAX format to wave drag format. The use of these programs saves time, improves the accuracy, and reduces the physical work required when converting data from one format to the other. Modifications have been made to both programs so that multi-segment fuselage geometric data can be converted and to the VORTWD program so that uncambered geometric data can also be obtained. Instructions for the use of these programs have not changed and may be found in reference 1.

WDTVOR

The program, WDTVOR, was developed so that data in wave drag format could easily be converted to VORLAX format. Modifications have been made to this

program in order that a multi-segment fuselage can be converted from wave drag format directly to a multi-panel fusiform representation in VORLAX format. All restrictions which applied to the original program are still applicable. A listing of the original program is presented in Appendix A, the modifications in Appendix B, and the modified program listing in Appendix C. For users at Langley Research Center, the modified program is stored as a public file in the catalog of user number 397868N under the name MWDTVOR.

VORTWD

The program VORTWD converts data from VORLAX input form into wave drag input format. This allows the data to be plotted using the program of reference 2 and saves considerable time and work if the configuration is also to be analyzed by another computer program which uses the wave drag input format. Modifications were made to the program in order to add the capability of handling multi-segment fusiform fuselage data and of converting the geometric data without including any camber.

A configuration is geometrically defined within the VORLAX program without twist or camber; these being accounted for by the boundary conditions. When a configuration has a large amount of camber, panels defining such items as nacelles and horizontal tails have to be relocated on the uncambered configuration in order to position them correctly in the flowfield. Plotting the geometric data without camber allows the correct locations of these panels to be more easily determined. The converted data with camber included is written on TAPE3 and without camber on TAPE4. Either or both of these tapes may be disposed to a punch file or used as an input data file for a subsequently called program.

The plot data card containing the rotation angles about which the configuration is plotted is no longer generated by the program. The addition of this card by the user allows the user to plot the views which he considers most desirable. A comparison of a configuration plotted with and without camber is shown in Figure 1.

A listing of the original program is presented in Appendix D, the modifications in Appendix E, and the modified program listing in Appendix F. For users at

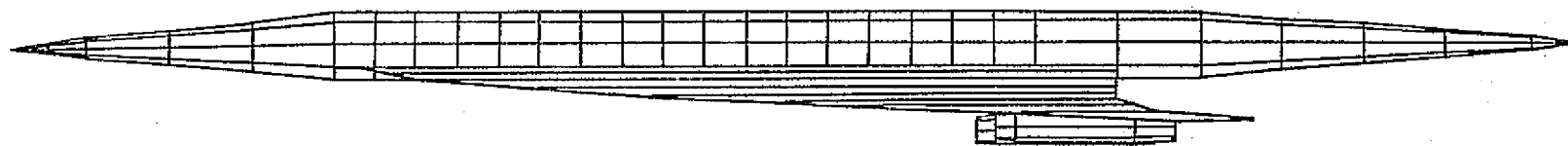
Langley Research Center, the modified program is stored as a public file in the catalog of user number 397868N under the name MVORTWD. All restrictions which applied to the original program are still applicable.

CONCLUDING REMARKS

Modifications to two computer programs, WDTVOR and VORTWD, which convert input data from wave drag input format to VORLAX input format and from VORLAX input format to wave drag input format have been presented. These modifications permit both programs to convert multi-segment fuselage data and the VORTWD program to convert VORLAX geometric data into wave drag format both with and without camber. The use of these programs reduces the physical work, improves the accuracy, and saves time when converting data from one format to the other.



a. Cambered configuration



b. Uncambered configuration

Figure 1. - Cambered and uncambered aircraft configurations

APPENDIX A
SOURCE LISTING OF ORIGINAL PROGRAM WDTVOR

PROGRAM WDTVORN 74/74 OPT=1

FTN 4.0+452

76/04/19. 13.28.52

1	PROGRAM WDTVORN(INPUT,OUTPUT,TAPE99=INPUT,TAPE6=OUTPUT,TAPE5,	WDTVORN	1
	1 TAPE3)	WDTVORN	2
	CONTROL+VRLX.WDTVORN	9/29/76 WDTVORN	3
	C	WDTVORN	4
5	C...THIS PROGRAM IS BASED ON NASA LRC PROGRAM D2500 -- WAVE DRAG	WDTVORN	5
	C	WDTVORN	6
	COMMON ABC (20), JO, J1, J2, J3, J4, J5, J6, NWAFF, NWAFFD, NFUS,	WDTVORN	7
	* NWAFF (4), NFURX (4), NP, NPDDR, NF, NFINDR, NCAN, NCANDR,	WDTVORN	8
	* J2TEST, LFKK, NRICH, REFA, NCASE, XHACH, NX, RTHETA, NREST,	WDTVORN	9
10	* XREST (10), SKL	WDTVORN	10
	COMMON/BLK2/V, XFUS1, XFUSN	WDTVORN	11
	COMMON/BLACK/XAF (30), WAFORG (20, 4), WAFORD (20, 3, 30),	WDTVORN	12
	* TZORD (20, 30), XFUS (30, 4), ZFUS (30, 4), SFUS (30, 30, 1),	WDTVORN	13
	* FUSARD (30, 4), FUSRAD (130, 4), PODORG (9, 3), XPDD (9, 30),	WDTVORN	14
15	* PDDR (9, 30), NPISPS (5), PDES (30, 30, 10), FINDRG (6, 2, 4),	WDTVORN	15
	* XFIN (6, 10), FINDRD (6, 2, 10), CANJRG (2, 2, 4), XCAN (2, 10),	WDTVORN	16
	* CANCRD (2, 2, 10), CANDRI (2, 2, 10)	WDTVORN	17
	C	WDTVORN	18
	DIMENSION ALPHA (7), YFUSMX (4, 30), AFUS (4, 29), XFPCT (50),	WDTVORN	19
20	* ZC12 (50), RCFUS(50)	WDTVORN	20
	DIMENSION ABCD (20)	WDTVORN	21
	DIMENSION ZCP12 (9, 30), PHI (10)	WDTVORN	22
	C	WDTVORN	23
	INTEGER FUSTYP	WDTVORN	24
25	C	WDTVORN	25
	DATA L3 /3/	WDTVORN	26
	DTR = .017453	WDTVORN	27
	CALL TRANS	WDTVORN	28
	CALL LSTDT8	WDTVORN	29
30	FUSTYP = 0	WDTVORN	30
	NSWVOR = 20	WDTVORN	31
	C	WDTVORN	32
	C READ NAMELIST CARDS	WDTVORN	33
	C	WDTVORN	34
35	NAMELIST /INPUT/FUSTYP, NSWVOR	WDTVORN	35
	READ (5, INPUT)	WDTVORN	36
	IF(EOF (5) .NE. 0) GO TO 760	WDTVORN	37
	C	WDTVORN	38
	C INPUT 1ST TWO CARDS (TITLE CARD ^ CONTROL FLAGS)	WDTVORN	39
40	C	WDTVORN	40
	10 FORMAT (20A4)	WDTVORN	41
	READ (5, 10) ABC	WDTVORN	42

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20	FORMAT (I11, 20A4)	WDTVORN	43
45	READ (5, 30) JO, J1, J2, J3, J4, J5, J6, NWAFF, NWAFFOR, NFUS, * (NRADX (1), NFORX (1), I = 1, 4), NP, NPDOOR, NF, NFINDR, * NCAN, NCANOR	WDTVORN	44
30	FORMAT (2413)	WDTVORN	45
C	INPUT CONFIGURATION DESCRIPTION AND INITIALIZE	WDTVORN	46
50	CALL START	WDTVORN	47
C	NKODE = 0	WDTVORN	48
C	INPUT CASE CARD	WDTVORN	49
55	READ (5, 40) NCASE, MACH, NX, NTHETA, NREST, NCON, NPLT	WDTVORN	50
C	KEY = 0	WDTVORN	51
40	FORMAT (A4, 5I4, 8I1)	WDTVORN	52
60	XMACH = FLOAT (MACH) / 1000.	WDTVORN	53
C	LERR = 0	WDTVORN	54
C	INPUT RESTRAINT POINTS	WDTVORN	55
C	IF (.NOT. (NKODE .EQ. 0 .AND. NREST .NE. 0)) GO TO 70	WDTVORN	56
65	READ (5, 50) XREST	WDTVORN	57
50	FORMAT (10F7.0)	WDTVORN	58
C	DO 60 I = 1, 10	WDTVORN	59
C	XREST (I) = XREST (I) / SKL	WDTVORN	60
60	CONTINUE	WDTVORN	61
70	NKODE = 1	WDTVORN	62
70	CONTINUE	WDTVORN	63
C	IN VORLAX SOME 19 CARDS ARE DESCRIBED. HOWEVER, THIS DOES NOT MEAN	WDTVORN	64
C	THAT INPUT FOR A CASE CONSISTS OF 19 CARDS. RATHER THESE SHOULD BE	WDTVORN	65
75	THOUGHT OF AS CARD TYPES. I FURTHERMORE, NOT ALL CARD TYPES WILL	WDTVORN	66
C	BE INCLUDED IN A GIVEN CASE, THOSE TO BE INCLUDED OR DELETED	WDTVORN	67
C	BEING A FUNCTION OF SOME OF THE INPUT CONTROL VALUES.	WDTVORN	68
C	THE FOLLOWING CARD NUMBERS ARE COMPATIBLE WITH THE VORLAX INPUT	WDTVORN	69
80	FORMAT AND A COMPLETE DESCRIPTION CAN BE FOUND IN THE VORLAX PROGRAM	WDTVORN	70
C	MANUAL LR 26299 SECTION 3.2.	WDTVORN	71
C	START CONSTRUCTION OF VORLAX DATASET	WDTVORN	72
C	PUTTING OUT TITLE CARD 1	WDTVORN	73
		WDTVORN	74
		WDTVORN	75
		WDTVORN	76
		WDTVORN	77
		WDTVORN	78
		WDTVORN	79
		WDTVORN	80
		WDTVORN	81
		WDTVORN	82
		WDTVORN	83
		WDTVORN	84

PROGRAM WDTVORN 74/74 OPT=1

FTN 4.6+452

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05      C      WRITE (L3, 10) ABC
          WRITE (6, 20) ABC
      C
      C      SETTING UP FOR CARD 2 (CONTROLS)
90      C
          ISOLV = 0
          LAX = 0
          LAY = 1
          REXPAR = -.02
95      C      HAG = 0.0
          FLOATX = 0.0
          FLOATY = 0.0
          IBCDN = 0
          ITRMAX = 0
100     C      WRITE (L3, 500) ISOLV, LAX, LAY, REXPAR, HAG, FLOATX, FLOATY,
          * IBCDN, ITRMAX
          WRITE (6, 510) ISOLV, LAX, LAY, REXPAR, HAG, FLOATX, FLOATY,
          * IBCDN, ITRMAX
      C
105     C      SET UP FOR CARD 3 (MACH NUMBERS)
      C
          NMACH = 1
          WRITE (L3, 520) NMACH, XMACH
          WRITE (6, 530) NMACH, XMACH
110     C
      C      SET UP FOR CARD 4 (ALPHA'S)
      C
          NALPHA = 3
          ALPHA (1) = 0.
          ALPHA (2) = 5.
115     C      ALPHA (3) = 10.
          WRITE (L3, 520) NALPHA, (ALPHA (I), I = 1, NALPHA)
          WRITE (6, 530) NALPHA, (ALPHA (I), I = 1, NALPHA)
      C
120     C      SET UP FOR CARD 5 (ASYMMETRIC CONTROLS)
      C
          LATRAL = 0
          PSI = 0
          PITCHO = 0
125     C      ROLLO = 0
          YAWO = 0

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WDTVORN 85
WDTVORN 86
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WDTVORN 125
WDTVORN 126

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PROGRAM WDTVORN 74/74 DPT=1

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	VINF = 0	WDTVORN 127
	WRITE (L3, 520) LATRAL, PSI, PITCHQ, ROLLO, YAWQ, VINF	WDTVORN 128
	WRITE (6, 530) LATRAL, PSI, PITCHQ, ROLLO, YAWQ, VINF	WDTVORN 129
130	C SET UP FOR CARD 6 (REFERENCE DIMENSIONS)	WDTVORN 130
	C	WDTVORN 131
	C	WDTVORN 132
	NFLSP = 0	WDTVORN 133
	IF (NFUS .GT. 0) NFUSP = 1	WDTVORN 134
135	NPAN = NWAFF - 1 + NF + NCAN + NFUSP + NP	WDTVORN 135
	SRIF = REFA	WDTVORN 136
	CBAR = 1.0	WDTVORN 137
	XBAR = 0.	WDTVORN 138
	ZBAR = 0.	WDTVORN 139
140	WSPAN = WAFERG (NWAFF, 2) *2.0	WDTVORN 140
	WRITE (L3, 540) NPAN, SREF, CBAR, XBAR, ZBAR, WSPAN	WDTVORN 141
	WRITE (6, 550) NPAN, SREF, CBAR, XBAR, ZBAR, WSPAN	WDTVORN 142
	C WING TREATMENT	WDTVORN 143
145	C SET UP FOR CARDS 7 (COORDS. OF ONE SIDE OF MAJOR PANEL)	WDTVORN 144
	C	WDTVORN 145
	C	WDTVORN 146
	C	WDTVORN 147
	IF (J1 .EQ. 0) GO TO 110	WDTVORN 148
	NWPAN = NWAFF - 1	WDTVORN 149
150	DO 90 NN = 1, NWAFF	WDTVORN 150
	DO 80 II = 1, NWAFF	WDTVORN 151
	TZORD (NN, II) = TZORD (NN, II) /WAFORG (NN, 4) *100.	WDTVORN 152
	80 CONTINUE	WDTVORN 153
	90 CONTINUE	WDTVORN 154
155	DO 100 IT = 1, NWPAN	WDTVORN 155
	WRITE (L3, 560) (WAFORG (IT, J), J = 1, 4), IT	WDTVORN 156
	WRITE (6, 570) (WAFORG (IT, J), J = 1, 4), IT	WDTVORN 157
	C SETTING UP FOR CARD 8 (COORDS. OF OTHER SIDE OF MAJOR WING PANEL)	WDTVORN 158
160	C	WDTVORN 159
	C	WDTVORN 160
	WRITE (L3, 560) (WAFORG (IT + 1, J), J = 1, 4), IT	WDTVORN 161
	WRITE (6, 570) (WAFORG (IT + 1, J), J = 1, 4), IT	WDTVORN 162
	C SETTING UP FOR CARD 9 (WING SUB PANEL CONTROLS)	WDTVORN 163
165	C	WDTVORN 164
	C	WDTVORN 165
	C	WDTVORN 166
	TNVOR = 3.0	WDTVORN 167
	RNCV = 10.	WDTVORN 168
	SPC = 1.	

	CURV = 0.	WDTVORN	169
170	WRITE (L3, 580) TNVOR, RNCV, SPL, CURV	WDTVORN	170
	WRITE (6, 590) TNVOR, RNCV, SPL, CURV	WDTVORN	171
	C	WDTVORN	172
	C	WDTVORN	173
	C	WDTVORN	174
175	SETTING UP FOR CARD 11 (ADDITIONAL WING CONTROL PARAMETERS)	WDTVORN	175
	AINC1 = 0.	WDTVORN	176
	AINC2 = 0.	WDTVORN	177
	ITS = 0	WDTVORN	178
	NAP = NWAFCR	WDTVORN	179
	IQUANT = 0	WDTVORN	180
180	ISYNT = 0	WDTVORN	181
	NPP = 0	WDTVORN	182
	WRITE (L3, 600) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP	WDTVORN	183
	WRITE (6, 610) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP	WDTVORN	184
185	C	WDTVORN	185
	C	WDTVORN	186
	IF (NAP .EQ. 0) GO TO 110	WDTVORN	187
	WRITE (L3, 620) (XAF (J), J = 1, NAP)	WDTVORN	188
	WRITE (6, 630) (XAF (J), J = 1, NAP)	WDTVORN	189
190	C	WDTVORN	190
	C	WDTVORN	191
	C	WDTVORN	192
	WRITE (L3, 640) (TZORD (IT, JJ), JJ = 1, NWAFCR)	WDTVORN	193
	WRITE (6, 650) (TZORD (IT, JJ), JJ = 1, NWAFCR)	WDTVORN	194
195	WRITE (L3, 640) (TZORD (IT + 1, JJ), JJ = 1, NWAFCR)	WDTVORN	195
	WRITE (6, 650) (TZORD (IT + 1, JJ), JJ = 1, NWAFCR)	WDTVORN	196
	100 CONTINUE	WDTVORN	197
	C	WDTVORN	198
	C	WDTVORN	199
200	C	WDTVORN	200
	110 IF (J2 .EQ. 0) GO TO 380	WDTVORN	201
	C	WDTVORN	202
	J2TEST = 1 FUSELAGE IS CIRCULAR AND UNCAMBERED	WDTVORN	203
	J2TEST = 2 FUSELAGE IS CIRCULAR AND CAMBERED	WDTVORN	204
205	C	WDTVORN	205
	J2TEST = 3 FUSELAGE IS ARBITRARY IN CROSS SECTION	WDTVORN	206
	C	WDTVORN	207
	GO TO (230, 230, 120), J2TEST	WDTVORN	208
	C	WDTVORN	209
	TREATMENT OF ARBITRARY FUSELAGE SECTIONS	WDTVORN	210
210	C	WDTVORN	211
	GETTING THE MAX Y VALUE AT EACH STATION		

PROGRAM WDTVORN

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FTN 4,6+452

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	C		WDTVORN	211
	120	DO 130 KI = 1, NFUS	WDTVORN	212
		KISS = NFORX (KI)	WDTVORN	213
		KUSS = NRADX (KI)	WDTVORN	214
215		DO 130 LN = 1, KISS	WDTVORN	215
		DO 130 IC = 1, KUSS	WDTVORN	216
		KEY = 2 * (KI - 1) + 1	WDTVORN	217
		IF (IC .EQ. 1) TEMP = 0.	WDTVORN	218
		IF (IC .GT. 1) TEMP = YFUSHX (KI, LN)	WDTVORN	219
220		IF (IC .EQ. NRADX (KI)) GO TO 130	WDTVORN	220
		YFUSHX (KI, LN) = AMAX1 (SFUS (IC, LN, KEY), TEMP)	WDTVORN	221
	130	CONTINUE	WDTVORN	222
	C		WDTVORN	223
225	C	GETTING THE INCREMENTAL FUSELAGE PLANFORM AREAS	WDTVORN	224
	C		WDTVORN	225
	140	DO 160 KI = 1, NFUS	WDTVORN	226
		KISS = NFORX (KI) - 1	WDTVORN	227
		DO 150 LN = 1, KISS	WDTVORN	228
		AFUS (KI, LN) = (YFUSHX (KI, LN + 1) + YFUSHX (KI, LN))	WDTVORN	229
230		* + (XFUS (LN + 1, KI) - XFUS (LN, KI)) / 2.0	WDTVORN	230
	150	CONTINUE	WDTVORN	231
	160	CONTINUE	WDTVORN	232
	C		WDTVORN	233
235	C	SOLVING FOR ZERO THICKNESS FUSELAGE PANEL COORDINATES	WDTVORN	234
	C		WDTVORN	235
		X MID = WAFORG (1, 1) + WAFORG (1, 4) / 2.0	WDTVORN	236
		DO 180 KI = 1, NFUS	WDTVORN	237
		KISS = NFORX (KI)	WDTVORN	238
		DO 170 LN = 1, KISS	WDTVORN	239
240		DX MID = X MID - XFUS (LN, KI)	WDTVORN	240
		IF (DX MID .LE. 0.) GO TO 190	WDTVORN	241
	170	CONTINUE	WDTVORN	242
	180	CONTINUE	WDTVORN	243
	190	KIMID = KI	WDTVORN	244
245		LN MID = LN	WDTVORN	245
		X DIV = XFUS (LN MID, KIMID)	WDTVORN	246
	C		WDTVORN	247
	C	INTEGRATE AREAS OF FWD FUSELAGE	WDTVORN	248
	C		WDTVORN	249
250		A1 = 0.	WDTVORN	250
		DO 200 KI = 1, KIMID	WDTVORN	251
		KISS = NFORX (KI) - 1	WDTVORN	252

PROGRAM WDTVORN

74/74

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FTN 4.6+452

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	IF (K1 .EQ. KIMID) KISS = LNMID -1	WDTVORN	253
	DO 200 LN = 1, KISS	WDTVORN	254
255	A1 = A1 + AFUS (K1, LN)	WDTVORN	255
	200 CONTINUE	WDTVORN	256
	DX1 = 2.0 *A1 /WAFORG (1, 2) - (XDIV - XFUS (1, 1))	WDTVORN	257
	XONE = XDIV - DX1	WDTVORN	258
	C	WDTVORN	259
260	C INTEGRATE AREAS OF AFT FUSELAGE PLANFORM	WDTVORN	260
	C	WDTVORN	261
	A2 = 0.	WDTVORN	262
	DO 220 KI = KIMID, NFUS	WDTVORN	263
	KISS = NFORX (KI) -1	WDTVORN	264
265	DO 210 LN = LNMID, KISS	WDTVORN	265
	A2 = A2 + AFUS (K1, LN)	WDTVORN	266
	210 CONTINUE	WDTVORN	267
	220 CONTINUE	WDTVORN	268
	DX2 = 2.0 *A2 /WAFORG (1, 2) - XFUS (NFORX (NFUS), NFUS) + XDIV	WDTVORN	269
270	XFUSS1 = XFUS (1, 1)	WDTVORN	270
	YFUSS1 = YFUSMX (1, 1)	WDTVORN	271
	ZFUSS = WAFORG (1, 3)	WDTVORN	272
	CORDF1 = XFUS (NFORX (NFUS), NFUS) - XFUS (1, 1)	WDTVORN	273
	XFUSS2 = XONE	WDTVORN	274
275	YFUSS2 = WAFORG (1, 2)	WDTVORN	275
	CORDF2 = DX1 + DX2	WDTVORN	276
	C	WDTVORN	277
	C CARD 7 OF FUSELAGE PANEL (COORDS. OF FUSELAGE PANEL CENTER LINE)	WDTVORN	278
	C	WDTVORN	279
280	WRITE (13, 720) XFUSS1, YFUSS1, ZFUSS, CORDF1	WDTVORN	280
	WRITE (6, 730) XFUSS1, YFUSS1, ZFUSS, CORDF1	WDTVORN	281
	C	WDTVORN	282
	C CARD 8 OF FUSELAGE PANEL (COORDS. OF FUSE. PANEL AT WING JUNCTURE)	WDTVORN	283
	C	WDTVORN	284
285	WRITE (13, 720) XFUSS2, YFUSS2, ZFUSS, CORDF2	WDTVORN	285
	WRITE (6, 730) XFUSS2, YFUSS2, ZFUSS, CORDF2	WDTVORN	286
	C	WDTVORN	287
	C CARD 9 OF FUSELAGE (SUB PANELLING CONTROLS)	WDTVORN	288
	C	WDTVORN	289
290	THVOR = 3.	WDTVORN	290
	RNCV = 2.0	WDTVORN	291
	SPC = 1.	WDTVORN	292
	CURV = 0.	WDTVORN	293
	WRITE (13, 580) INVOR, RNCV, SPC, CURV	WDTVORN	294

PROGRAM WDTVORN

74/74 OPT=1

FTN 4,6+452

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295	WRITE (6, 590) INVD, RNCV, SPC, CURV	WDTVORN	295
	C	WDTVORN	296
	C SET UP FOR CARD 11 (ADDITIONAL CONTROL PARAMETERS FOR FUSELAGE)	WDTVORN	297
	C	WDTVORN	298
	AINC1 = 0.	WDTVORN	299
300	AINC2 = 0.	WDTVORN	300
	JITS = 0	WDTVORN	301
	NAP = 0	WDTVORN	302
	IF (J2TEST .EQ. 2) NAP=NFORX(1)+NFORX(2)+NFORX(3)+NFORX(4)-NFUS+1	WDTVORN	303
	IQUANT = 0	WDTVORN	304
305	ISYNT = 0	WDTVORN	305
	NPP = 0	WDTVORN	306
	WRITE (13, 600) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP	WDTVORN	307
	WRITE (6, 610) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP	WDTVORN	308
	IF (NAP .NE. 0) GO TO 360	WDTVORN	309
310	C	WDTVORN	310
	C	WDTVORN	311
	GO TO 380	WDTVORN	312
	C	WDTVORN	313
	C START OF CIRCULAR FUSELAGE TREATMENT	WDTVORN	314
315	C	WDTVORN	315
	230 DO 240 KI = 1, NFUS	WDTVORN	316
	KISS = NFORX (KI)	WDTVORN	317
	DO 240 LN = 1, KISS	WDTVORN	318
	YFUSPX (KI, LN) = FUSRAD (LN, KI)	WDTVORN	319
320	240 CONTINUE	WDTVORN	320
	C	WDTVORN	321
	C IF CIRCULAR FUSELAGE IS CAMBERED THEN GO TO GET FUSE. CAMBER ORDS.	WDTVORN	322
	C	WDTVORN	323
	IF (FUSTYP .EQ. 1) GO TO 250	WDTVORN	324
325	GO TO (140, 340, 140), J2TEST	WDTVORN	325
	C	WDTVORN	326
	C BEGIN OCTAGONAL FUSELAGE TREATMENT	WDTVORN	327
	C	WDTVORN	328
	250 XFUSS1 = XFUS (1, 1)	WDTVORN	329
330	C	WDTVORN	330
	C DETERMINE WHICH TWO FUSE STNS BRACKET X OF WING ROOT L E	WDTVORN	331
	C	WDTVORN	332
	DO 260 KI = 1, NFUS	WDTVORN	333
	KISS = NFORX (KI)	WDTVORN	334
335	DO 260 LN = 1, KISS	WDTVORN	335
	DXWLE = WAFORG (1,1) - XFUS (LN, KI)	WDTVORN	336

PROGRAM WDTVORN

74/74 OPT=1

FTN 4.6+452

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	IF (DXWLL .LE. 0) GO TO 270	WDTVORN	337
260	CONTINUE	WDTVORN	338
270	XAFT = XFUS (LN, KI)	WDTVORN	339
340	IF (LN .GT. 1) XFWD = XFUS (LN - 1, KI)	WDTVORN	340
	IF (LN .EQ. 1) XFWD = XFUS (KISS, KI - 1)	WDTVORN	341
	C DETERMINE FUSELAGE CAMBER AT WING ROOT L E	WDTVORN	342
	C	WDTVORN	343
345	ZAFT = ZFUS (LN, KI)	WDTVORN	344
	IF (LN .GT. 1) ZFWD = ZFUS (LN - 1, KI)	WDTVORN	345
	IF (LN .EQ. 1) ZFWD = ZFUS (KISS, KI - 1)	WDTVORN	346
	SLOPE = (ZAFT - ZFWD) / (XAFT - XFWD)	WDTVORN	347
	ZFWLE = ZFWD + (WAFORG (1,1) - XFWD) * SLOPE	WDTVORN	348
350	C	WDTVORN	349
	C DETERMINE PHI ^ RHO FROM FUSE C-LINE TO WING L E ROOT	WDTVORN	350
	C	WDTVORN	351
	RHOREF = SQRT ((WAFORG (1,3) - ZFWLE) **2 + WAFORG (1,2) **2)	WDTVORN	352
	PHIREF = ATAN ((WAFORG (1,3) - ZFWLE) / WAFORG (1,2)) / DTR	WDTVORN	353
355	C	WDTVORN	354
	C SET UP CARDS 7 ^ 8 OF OCTAGONAL FUSELAGE	WDTVORN	355
	C	WDTVORN	356
	XFUSS1 = XFUS (1,1)	WDTVORN	357
	YFUSS1 = 0.	WDTVORN	358
360	ZFUSS1 = ZFWLE + RHOREF	WDTVORN	359
	ZFUSS2 = ZFWLE - RHOREF	WDTVORN	360
	CORDF1 = XFUS (NFORX (NFUS), NFUS) - XFUS (1,1)	WDTVORN	361
	C	WDTVORN	362
365	C CARD 7 ^ 8 OF OCTAGONAL FUSELAGE	WDTVORN	363
	C	WDTVORN	364
	WRITE (13,720) XFUSS1, YFUSS1, ZFUSS1, CORDF1	WDTVORN	365
	WRITE (6,730) XFUSS1, YFUSS1, ZFUSS1, CORDF1	WDTVORN	366
	WRITE (13,720) XFUSS1, YFUSS1, ZFUSS2, CORDF1	WDTVORN	367
	WRITE (6,730) XFUSS1, YFUSS1, ZFUSS2, CORDF1	WDTVORN	368
370	C	WDTVORN	369
	C CARD 9 (SUB PANEL CONTROLS OF OCTAGONAL FUSELAGE)	WDTVORN	370
	C	WDTVORN	371
	THVOR = 4	WDTVORN	372
	RNCV = NFORX (1) + NFORX (2) + NFORX (3) + NFORX (4) - NFUS	WDTVORN	373
375	SPC = 1.0	WDTVORN	374
	CURV = 999.	WDTVORN	375
	WRITE (13, 580) THVOR, RNCV, SPC, CURV	WDTVORN	376
	WRITE (6, 590) THVOR, RNCV, SPC, CURV	WDTVORN	377
		WDTVORN	378

PROGRAM WDTVORN 74/74 OPT=1

FTN 4.6+452

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	C		WDTVORN	379
380	C	SET UP POLAR COORDINATES FOR REFERENCE OCTAGON	WDTVORN	380
	C		WDTVORN	381
		DUPER = 90 - PHIREF	WDTVORN	382
		PANUP = DUPER / 45	WDTVORN	383
		IPANUP = PANUP + .5	WDTVORN	384
385		DPHEU = DUPER / IPANUP	WDTVORN	385
		DPHLO = (180 - DUPER) / (4 - IPANUP)	WDTVORN	386
		DO 290 JK=1,5	WDTVORN	387
		IF (JK .LE. IPANUP) PHI (JK) = 90 - (JK - 1) * DPHEU	WDTVORN	388
		IF (JK .GT. IPANUP) PHI (JK) = 90 - IPANUP * DPHEU - DPHLO * (JK - 1 - IPANUP)	WDTVORN	389
390	290	CONTINUE	WDTVORN	390
		WRITE (13, 620) ((PHI (JK), RHUREF), JK = 1, 5)	WDTVORN	391
		WRITE (16, 630) ((PHI (JK), RHUREF), JK = 1, 5)	WDTVORN	392
	C		WDTVORN	393
395	C	SET UP FOR CARD 11 OF OCTAGONAL FUSE (ADDITIONAL CONTROL PARAMETERS)	WDTVORN	394
	C		WDTVORN	395
		AINC1 = 0.	WDTVORN	396
		AINC2 = 0.	WDTVORN	397
		ITS = 1	WDTVORN	398
		NAP = RNCV + 1	WDTVORN	399
400		IF (J2TEST .EQ. 1) NAP = 0	WDTVORN	400
		IQUANT = 0	WDTVORN	401
		ISYNT = 0	WDTVORN	402
		NPP = 1	WDTVORN	403
		WRITE (13, 600) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP	WDTVORN	404
405		WRITE (16, 610) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP	WDTVORN	405
		IF (NAP .EQ. 0) GO TO 380	WDTVORN	406
	C		WDTVORN	407
	C	CARD 14 OF OCTAGONAL FUSELAGE (PERCENT LENGTH STATION OF FUSELAGE)	WDTVORN	408
	C		WDTVORN	409
410		JJ = 1	WDTVORN	410
		DO 310 KI = 1, NFUS	WDTVORN	411
		KISS = NFURX (KI) - 1	WDTVORN	412
		IF (KI .EQ. NFUS) KISS = NFURX (NFUS)	WDTVORN	413
		DO 300 LN = 1, KISS	WDTVORN	414
415		XFPCT (JJ) = XFUS (LN, KI) / (XFUSN - XFUS1) * 100.	WDTVORN	415
		ZC12 (JJ) = ZFUS (LN, KI) / (XFUSN - XFUS1) * 100.	WDTVORN	416
		RDFUS (JJ) = FUSRAD (LN, KI)	WDTVORN	417
		JJ = JJ + 1	WDTVORN	418
	300	CONTINUE	WDTVORN	419
420	310	CONTINUE	WDTVORN	420

PROGRAM WDTVORN

74/74 OPT=1

FTN 4.6+452

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	DD 320 JJ = 1, NAP	WDTVORN	421
	IF ((XFPCT(JJ+1)*(XFUSN-XFUS1)/100.) .GT. WAFORG (1,1) .AND.	WDTVORN	422
	* (XFPCT(JJ-1)*(XFUSN-XFUS1)/100.) .LT.	WDTVORN	423
	* (WAFORG (1,1) + WAFORG (1,4))) ROFUS (JJ) = RHOREF	WDTVORN	424
425	320 CONTINUE	WDTVORN	425
	WRITE (L3, 620) (XFPCT (J), J = 1, NAP)	WDTVORN	426
	WRITE (6, 630) (XFPCT (J), J = 1, NAP)	WDTVORN	427
	C	WDTVORN	428
	C SETTING UP FOR CARD 16 OF OCTAGONAL FUSELAGE (AREA RATIOS WRT.	WDTVORN	429
430	C REFERENCE OCTAGON)	WDTVORN	430
	C	WDTVORN	431
	DD 330 LL = 1, NAP	WDTVORN	432
	ROFUS (LL) = (ROFUS (LL) /RHOREF) **2 *100.	WDTVORN	433
	330 CONTINUE	WDTVORN	434
435	WRITE (L3, 620) (ZC12 (JJ), JJ = 1, NAP)	WDTVORN	435
	WRITE (6, 630) (ZC12 (JJ), JJ = 1, NAP)	WDTVORN	436
	WRITE (L3, 620) (ROFUS (LL), LL = 1, NAP)	WDTVORN	437
	WRITE (6, 630) (ROFUS (LL), LL = 1, NAP)	WDTVORN	438
	GO TO 380	WDTVORN	439
440	C	WDTVORN	440
	C SET UP FOR CARDS 14, 16, 18 OF ZERO THICKNESS FUSELAGE TREATMENT	WDTVORN	441
	C	WDTVORN	442
	340 JJ = 1	WDTVORN	443
	DD 350 KI = 1, NFUS	WDTVORN	444
445	KISS = NFORS (KI) -1	WDTVORN	445
	IF (KI .EQ. NFUS) KISS = NFORS (NFUS)	WDTVORN	446
	DD 350 LN = 1, KISS	WDTVORN	447
	XFPCT (JJ) = XFUS (LN, KI) / (XFUSN - XFUS1) *100.	WDTVORN	448
	ZC12 (JJ) = (ZFUS (LN, KI) - (ZFUS (1,1) - WAFORG (1,3))) / (XFUSN - XFUS1) *100.	WDTVORN	449
450	JJ = JJ + 1	WDTVORN	450
	350 CONTINUE	WDTVORN	451
	GO TO 140	WDTVORN	452
	360 WRITE (L3, 620) (XFPCT (J), J = 1, NAP)	WDTVORN	453
	WRITE (6, 630) (XFPCT (J), J = 1, NAP)	WDTVORN	454
455	DD 370 I = 1, 2	WDTVORN	455
	WRITE (L3, 620) (ZC12 (J), J = 1, NAP)	WDTVORN	456
	WRITE (6, 630) (ZC12 (J), J = 1, NAP)	WDTVORN	457
	370 CONTINUE	WDTVORN	458
	C	WDTVORN	459
460	C NACELLE TREATMENT	WDTVORN	460
	C SETTING UP FOR CARD 7 ^ 8	WDTVORN	461
	C	WDTVORN	462

PROGRAM WDTVORN 74/74 OPT=1

FTN 4.6+452

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380 IF (JJ.EQ. 0) GO TO 450
DO 440 JJ = 1, NP
465 X1 = PODORG (JJ, 1)
Y1 = PODORG (JJ, 2)
Z1 = PODORG (JJ, 3) + PODORD (JJ, 1)
CORD1 = XPDD (JJ, NPODDR) - XPDD (JJ, 1)
470 DD 390 KK = 1, 2
WRITE (L3, 740) X1, Y1, Z1, CORD1, JJ
WRITE (6, 750) X1, Y1, Z1, CORD1, JJ
390 CONTINUE
C
C SETTING UP FOR NACELLE CARD 9
475 C
TNVOR = 8
RNCV = NPODDR - 1
IF (RNCV.LT. 5) RNCV = 5
SPC = 0.
480 CURV = 999.
WRITE (L3, 580) TNVOR, RNCV, SPC, CUPV
WRITE (6, 590) TNVOR, RNCV, SPC, CURV
C
C SET UP FOR NACELLE CARD 10 (POLAR COORDS. OF CURVED PANELS)
485 C
DO 400 JK = 1, 9
PHI (JK) = 90. - (JK - 1) * 45.
RHO = PODORD (JJ, 1)
490 CONTINUE
WRITE (L3, 620) ((PHI (JK), RHO), JK = 1, 9)
WRITE (6, 630) ((PHI (JK), RHO), JK = 1, 9)
C
C SET UP FOR CARD 11 (ADDITIONAL CONTROL PARAMETERS)
495 C
AINC1 = 0.
AINC2 = 0.
ITS = 0
NAP = NPODDR
IQUANT = 0
500 ISYNT = 0
NPP = 1
WRITE (L3, 600) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP
WRITE (6, 610) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP
C

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WDTVORN 463
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505	C	SET UP FOR NACELLE CARD 14 (PERCENT LENGTH STATIONS)	WDTVORN	505
	C	DO 410 LL = 1, NAP	WDTVORN	506
		XAF (LL) = ((XPOD (JJ, LL) - XPOD (JJ, 1)) / (XPOD (JJ, NAP)	WDTVORN	507
		* - XPOD (JJ, 1))) **2 *100.	WDTVORN	508
510	410	CONTINUE	WDTVORN	509
		WRITE (L3, 620) (XAF (J), J = 1, NAP)	WDTVORN	510
		WRITE (6, 630) (XAF (J), J = 1, NAP)	WDTVORN	511
	C		WDTVORN	512
515	C	SETTING UP FOR NACELLE CARD 16 ^ 16 (PERCENT OF REFERENCE OCTAGON)	WDTVORN	513
	C	DO 420 LL = 1, NAP	WDTVORN	514
		ZCP12 (JJ, LL) = POLORD (JJ, LL) / POLORD (JJ, 1) *100.	WDTVORN	515
	420	CONTINUE	WDTVORN	516
		ZERO = 0.	WDTVORN	517
520		WRITE (L3, 620) (ZERO)	WDTVORN	518
		WRITE (6, 620) (ZERO)	WDTVORN	519
		WRITE (L3, 620) (ZCP12 (JJ, LL), LL = 1, NAP)	WDTVORN	520
		WRITE (6, 630) (ZCP12 (JJ, LL), LL = 1, NAP)	WDTVORN	521
	440	CONTINUE	WDTVORN	522
525	C		WDTVORN	523
	C	FINS TREATMENT	WDTVORN	524
	C		WDTVORN	525
	C	SET FOR CARDS 7 ^ 8 (BOTH SIDES OF MAJOR PANEL)	WDTVORN	526
	C		WDTVORN	527
530	450	IF (J4 .EQ. 0) GO TO 470	WDTVORN	528
		DO 460 NH = 1, NF	WDTVORN	529
		WRITE (L3, 660) ((FINORG (NH, 1, J), J = 1, 4), NH, I = 1, 2)	WDTVORN	530
		WRITE (6, 670) ((FINORG (NH, 1, J), J = 1, 4), NH, I = 1, 2)	WDTVORN	531
	C		WDTVORN	532
535	C	SETTING UP FOR CARD 9 (SUB PANEL CONTROLS)	WDTVORN	533
	C		WDTVORN	534
		TNVOR = 2.0	WDTVORN	535
		RNCV = 10.	WDTVORN	536
		SPC = 1.	WDTVORN	537
540		CURV = 0.	WDTVORN	538
		WRITE (L3, 580) TNVOR, RNCV, SPC, CURV	WDTVORN	539
		WRITE (6, 590) TNVOR, RNCV, SPC, CURV	WDTVORN	540
	C		WDTVORN	541
	C	SETTING UP FOR CARD 11 (ADDITIONAL CONTROL PANEL FOR FINS)	WDTVORN	542
545	C		WDTVORN	543
		AINCI = 0.	WDTVORN	544
			WDTVORN	545
			WDTVORN	546

PROGRAM WDTVORN 74/74 OPT=1

FTN 4.6+492

78/04/19. 13.28.52

	AINC2 = 0.	WDTVORN	547
	ITS = 0	WDTVORN	548
	NAP = 0	WDTVORN	549
550	IOUANT = 0	WDTVORN	550
	ISYNT = 0	WDTVORN	551
	NPP = C	WDTVORN	552
	WRITE (L3, 600) AINC1, AINC2, ITS, NAP, IOUANT, ISYNT, NPP	WDTVORN	553
	WRITE (6, 610) AINC1, AINC2, ITS, NAP, IOUANT, ISYNT, NPP	WDTVORN	554
555	460 CONTINUE	WDTVORN	555
	470 IF (J5.EQ. 0) GO TO 490	WDTVORN	556
	C	WDTVORN	557
	C SETUP FOR CANARDS	WDTVORN	558
	C	WDTVORN	559
560	C SET UP FOR CARDS 7 ^ 8 (BOTH SIDES OF MAJOR PANELS)	WDTVORN	560
	C	WDTVORN	561
	DO 480 NN = 1, NCAN	WDTVORN	562
	WRITE (L3, 680) ((CANDRG (NN, I, J), J = 1, 4), NN, I = 1, 2)	WDTVORN	563
	WRITE (6, 690) ((CANDRG (NN, I, J), J = 1, 4), NN, I = 1, 2)	WDTVORN	564
565	C	WDTVORN	565
	C SETTING UP FOR CARD 9 (SUB PANEL CONTROLS)	WDTVORN	566
	C	WDTVORN	567
	TNVOR = 2.0	WDTVORN	568
	RNCV = 10.	WDTVORN	569
570	SPC = 1.	WDTVORN	570
	CURV = 0.	WDTVORN	571
	WRITE (L3, 580) TNVOR, RNCV, SPC, CURV	WDTVORN	572
	WRITE (6, 590) TNVOR, RNCV, SPC, CURV	WDTVORN	573
	C	WDTVORN	574
575	C SETTING UP FOR CARD 11 (ADDITIONAL CONTROL PANELS FOR CANARDS)	WDTVORN	575
	C	WDTVORN	576
	AINC1 = 0.	WDTVORN	577
	AINC2 = 0.	WDTVORN	578
	ITS = 0	WDTVORN	579
580	NAP = 0	WDTVORN	580
	IOUANT = 0	WDTVORN	581
	ISYNT = 0	WDTVORN	582
	WRITE (L3, 600) AINC1, AINC2, ITS, NAP, IOUANT, ISYNT, NPP	WDTVORN	583
	WRITE (6, 610) AINC1, AINC2, ITS, NAP, IOUANT, ISYNT, NPP	WDTVORN	584
585	480 CONTINUE	WDTVORN	585
	490 NXS = C	WDTVORN	586
	NYS = 0	WDTVORN	587
	NZS = 0	WDTVORN	588

PROGRAM WDTVORN 74/74 OPT=1

FTN 4.6+452

7E/04/19. 13.28.52

	WRITE (13, 700) NXS, NYS, NZS	WDTVORN	589
590	WRITE (6, 710) NXS, NYS, NZS	WDTVORN	590
	500 FORMAT (3 (I2, 8X), 4F10.4, I2, 5X, I3)	WDTVORN	591
	510 FORMAT (1H, 3 (I2, 8X), 4F10.4, I2, 5X, I3)	WDTVORN	592
	520 FORMAT (I2, 8X, 7F10.3)	WDTVORN	593
	530 FORMAT (1H, I2, 8X, 7F10.3)	WDTVORN	594
595	540 FORMAT (I2, 8X, F10.2, 4F10.4)	WDTVORN	595
	550 FORMAT (1H, I2, 8X, F10.2, 4F10.4)	WDTVORN	596
	560 FORMAT (4F10.4, 10X, "WING PANEL NO.", I2)	WDTVORN	597
	570 FORMAT (1H, 4F10.4, 10X, 14HWING PANEL NO., I2)	WDTVORN	598
	580 FORMAT (4F10.4, 10X, 17HNVOR, RNCV, SPC, PDL)	WDTVORN	599
600	590 FORMAT (1H, 4F10.4, 10X, 17HNVOR, RNCV, SPC, PDL)	WDTVORN	600
	600 FORMAT (2F10.4, 5 (I2, 8X))	WDTVORN	601
	610 FORMAT (1H, 2F10.4, 5 (I2, 8X))	WDTVORN	602
	620 FORMAT (8F10.4)	WDTVORN	603
	630 FORMAT (1H, 8F10.4)	WDTVORN	604
605	640 FORMAT (8F10.4)	WDTVORN	605
	650 FORMAT (1H, 8F10.4)	WDTVORN	606
	660 FORMAT (4F10.4, 10X, 13HFIN PANEL NO., I2)	WDTVORN	607
	670 FORMAT (1H, 4F10.4, 10X, 13HFIN PANEL NO., I2)	WDTVORN	608
	680 FORMAT (4F10.4, 10X, 16HCANARD PANEL NO., I2)	WDTVORN	609
610	690 FORMAT (1H, 4F10.4, 10X, 16HCANARD PANEL NO., I2)	WDTVORN	610
	700 FORMAT (3 (I2, 8X), 10X, 11PNXS, NYS, NZS)	WDTVORN	611
	710 FORMAT (1H, 3 (I2, 8X), 10X, 11PNXS, NYS, NZS)	WDTVORN	612
	720 FORMAT (4F10.4, 10X, 14HFUSelage PANEL)	WDTVORN	613
	730 FORMAT (1H, 4F10.4, 10X, 14HFUSelage PANEL)	WDTVORN	614
615	740 FORMAT (4F10.4, 10X, 16HNACELLE PANEL NO, I2)	WDTVORN	615
	750 FORMAT (1H, 4F10.4, 10X, 16HNACELLE PANEL NO, I2)	WDTVORN	616
	760 STOP	WDTVORN	617
	END	WDTVORN	618

SUBROUTINE START

74/74 OPT=1

FTN 4.6+45Z

78/04/19. 13.28.52

1		SUBROUTINE START	WDTVORN	619
	C		WDTVORN	620
	C	INPUTS AND INITIALIZES CONFIGURATION DESCRIPTION	WDTVORN	621
	C	REFERENCE NASA TM X-2074, SEPT 1970	WDTVORN	622
5	C		WDTVORN	623
		COMMON ABC (20), JO, J1, J2, J3, J4, J5, J6, NWA, NWAORD, NFUS,	WDTVORN	624
		* NRADX (4), NFORX (4), NP, NPOORD, NF, NFINOR, NCAN, NCANOR,	WDTVORN	625
		* J2TEST, LERR, NRICH, REFA, NCASE, XMACH, NX, NTHETA, NRES,	WDTVORN	626
		* XREST (10), SKL	WDTVORN	627
10		COMMON/BLK2/V, XFUS1, XFUSN	WDTVORN	628
		COMMON/BLACK/XAF (30), WAFORG (20, 4), WAFORD (20, 3, 30),	WDTVORN	629
		* TZORD (20, 30), XFUS (30, 4), ZFUS (30, 4), SFUS (30, 30, 1),	WDTVORN	630
		* FUSARD (30, 4), FUSRAD (130, 4), PDDORG (9, 3), XPUU (9, 30),	WDTVORN	631
		* PDDORD (9, 30), NPTSPS (5), PDES (30, 30, 10), FINORG (6, 2, 4),	WDTVORN	632
15		* XFIN (6, 10), FINORD (6, 2, 10), CANORG (2, 2, 4), XCAN (2, 10),	WDTVORN	633
		* CANORD (2, 2, 10), CANORI (2, 2, 10)	WDTVORN	634
	C		WDTVORN	635
		DIMENSION ABCD (20), FORAG (4), PARNO (5), PARBA (5)	WDTVORN	636
	C		WDTVORN	637
20		DATA PI/3.14159265/	WDTVORN	638
	C		WDTVORN	639
	10	FORMAT (10F7.0)	WDTVORN	640
	C		WDTVORN	641
	C	REFERENCE AREA	WDTVORN	642
25	C		WDTVORN	643
		IF (JO .NE. 1) GO TO 140	WDTVORN	644
		READ (5, 10) REFA, SKL	WDTVORN	645
		IF (SKL .EQ. 0.) SKL = 1.	WDTVORN	646
	C		WDTVORN	647
30	C	WING	WDTVORN	648
	C		WDTVORN	649
		IF (J1 .NE. 2) GO TO 20	WDTVORN	650
		GO TO 110	WDTVORN	651
	20	V = 0.	WDTVORN	652
35		IF (J1 .EQ. 0) GO TO 140	WDTVORN	653
		N = IABS (NWAORD)	WDTVORN	654
		NREC = (N + 9) / 10	WDTVORN	655
		I1 = -9	WDTVORN	656
		I2 = 0	WDTVORN	657
40		DO 30 NN = 1, NREC	WDTVORN	658
		I1 = I1 + 10	WDTVORN	659
		I2 = I2 + 10	WDTVORN	660

SUBROUTINE START

74/74 OPT=1

FTN 4.6+452

78/04/19, 13.28.52

		READ (5, 10) (XAF (I), I = 11, 12)	WDTVORN	661
	30	CONTINUE	WDTVORN	662
45		DO 40 I = 1, NNAF	WDTVORN	663
		READ (5, 10) (WAFORG (I, J), J = 1, 4)	WDTVORN	664
		DO 40 J = 1, 4	WDTVORN	665
		WAFORG (I, J) = WAFORG (I, J) / SKL	WDTVORN	666
	40	CONTINUE	WDTVORN	667
50		IF (J1 .LT. 0) GO TO 70	WDTVORN	668
		DO 60 NN = 1, NNAF	WDTVORN	669
		I1 = -9	WDTVORN	670
		I2 = 0	WDTVORN	671
		DO 50 N1 = 1, NREC	WDTVORN	672
55		I1 = I1 + 10	WDTVORN	673
		I2 = I2 + 10	WDTVORN	674
		READ (5, 10) (TZORD (NN, I), I = 11, 12)	WDTVORN	675
		DO 50 I = 11, 12	WDTVORN	676
		TZORD (NN, I) = TZORD (NN, I) / SKL	WDTVORN	677
60	50	CONTINUE	WDTVORN	678
	60	CONTINUE	WDTVORN	679
		GO TO 90	WDTVORN	680
	70	DO 80 I = 1, NNAF	WDTVORN	681
		DO 80 K = 1, N	WDTVORN	682
65	80	TZORD (I, K) = 0.	WDTVORN	683
	90	L = 1	WDTVORN	684
		IF (NNAFOR .LT. 0) L = 2	WDTVORN	685
		DO 110 NN = 1, NNAF	WDTVORN	686
		DO 110 K = 1, L	WDTVORN	687
70		I1 = -9	WDTVORN	688
		I2 = 0	WDTVORN	689
		DO 100 N1 = 1, NREC	WDTVORN	690
		I1 = I1 + 10	WDTVORN	691
		I2 = I2 + 10	WDTVORN	692
75		READ (5, 10) (WAFORD (NN, K, I), I = 11, 12)	WDTVORN	693
	100	CONTINUE	WDTVORN	694
	110	CONTINUE	WDTVORN	695
		IF (NNAFOR .LT. 0) GO TO 130	WDTVORN	696
		DO 120 NN = 1, NNAF	WDTVORN	697
		DO 120 K = 1, N	WDTVORN	698
80	120	WAFORD (NN, 2, K) = WAFORD (NN, 1, K)	WDTVORN	699
	130	CONTINUE	WDTVORN	700
		NNAFOR = IABS (NNAFOR)	WDTVORN	701
		J1 = IABS (J1)	WDTVORN	702

SUBROUTINE START

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85	C		WDTVORN	703
	C	FUSELAGE	WDTVORN	704
	C		WDTVORN	705
		140 IF (J2 .NE. 2) GO TO 150	WDTVORN	706
		GO TO 310	WDTVORN	707
90		150 IF (J2 .EQ. 0) GO TO 310	WDTVORN	708
		J2TEST = 3	WDTVORN	709
		IF (J2 .EQ. -1 .AND. J6 .EQ. -1) J2TEST = 1	WDTVORN	710
		IF (J2 .EQ. -1 .AND. J6 .EQ. 0) J2TEST = 2	WDTVORN	711
		IF (J6 .EQ. 1) J2TEST = 1	WDTVORN	712
95		J2 = 1	WDTVORN	713
		NSUM = 1	WDTVORN	714
		DO 160 NFU = 1, NFUS	WDTVORN	715
		160 NSUM = NSUM + NFORX (NFU) -1	WDTVORN	716
		IF (NSUM .LE. 101) GO TO 160	WDTVORN	717
100		WRITE (6, 170)	WDTVORN	718
		170 FORMAT (//	WDTVORN	719
		* 60H CONSECUTIVE FUSELAGE POINTS EXCEED ALLOWABLE STORAGE OF 101 /	WDTVORN	720
		* 1H1)	WDTVORN	721
		STOP	WDTVORN	722
105		180 CONTINUE	WDTVORN	723
		DO 270 NFU = 1, NFUS	WDTVORN	724
		N = NFORX (NFU)	WDTVORN	725
		NRAD = NRADX (NFU)	WDTVORN	726
		NREC = (N + 9) / 10	WDTVORN	727
110		I1 = -9	WDTVORN	728
		I2 = 0	WDTVORN	729
		DO 190 N1 = 1, NREC	WDTVORN	730
		I1 = I1 + 10	WDTVORN	731
		I2 = I2 + 10	WDTVORN	732
115		READ (5, 10) (XFUS (I, NFU), I = I1, I2)	WDTVORN	733
		DO 190 I = I1, I2	WDTVORN	734
		XFUS (I, NFU) = XFUS (I, NFU) / SKL	WDTVORN	735
		190 CONTINUE	WDTVORN	736
		IF (NFU .NE. 1) GO TO 200	WDTVORN	737
120		XFUS1 = XFUS (1, 1)	WDTVORN	738
		XFUSN = XFUS (N, 1)	WDTVORN	739
		200 XFUS1 = AMIN1 (XFUS1, XFUS (1, NFU))	WDTVORN	740
		XFUSN = AMAX1 (XFUSN, XFUS (N, NFU))	WDTVORN	741
		IF (J2TEST .NE. 2) GO TO 220	WDTVORN	742
125		I1 = -9	WDTVORN	743
		I2 = 0	WDTVORN	744

SUBROUTINE START

74/74 OPT=1

FTN 4.6+452

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130      DO 210 N1 = 1, NREC
          I1 = I1 + 10
          I2 = I2 + 10
          READ (5, 10) (ZFUS (I, NFU), I = I1, I2)
          DO 210 I = I1, I2
              ZFUS (I, NFU) = ZFUS (I, NFU) /SKL
210      CONTINUE
          GO TO 240
135      DO 230 I = 1, N
          230  ZFUS (I, NFU) = 0.
          240  IF (J2TEST .NE. 3) GO TO 280
              NCARD = (NRAD + 9) /10
              DO 270 LN = 1, N
140          DO 260 K = 1, 2
              KK = K + (NFU - 1) *2
              I1 = 10
              I1 = -9
              I2 = 0
145          DO 250 NN = 1, NCARD
              IF (NN .EQ. NCARD) I1 = MOD (NRAD, 10)
              IF (I1 .EQ. 0) I1 = 10
              I1 = I1 + 10
              I2 = I2 + I1
150          READ (5, 10) (SFUS (I, LN, KK), I = I1, I2)
              DO 250 I = I1, I2
                  SFUS (I, LN, KK) = SFUS (I, LN, KK) /SKL
250          CONTINUE
260          CONTINUE
155      270          CONTINUE
              GO TO 310
280          I1 = -9
              I2 = 0
160          DO 290 N1 = 1, NREC
              I1 = I1 + 10
              I2 = I2 + 10
              READ (5, 10) (FUSARD (I, NFU), I = I1, I2)
              DO 290 I = I1, I2
                  FUSARD (I, NFU) = FUSARD (I, NFU) /SKL**2
165          290          CONTINUE
              DO 300 I = 1, N
              300  FUSRAD (I, NFU) = SORT (FUSARD (I, NFU) /PI)

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WDTVORN 745
WDTVORN 746
WDTVORN 747
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WDTVORN 785
WDTVORN 786

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SUBROUTINE START

74/74 OPT=1

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	C	NACELLES	WDTVORN	787
170	C		WDTVORN	788
	310	IF (J3 .NE. 2) GO TO 320	WDTVORN	789
		GO TO 440	WDTVORN	790
	320	IF (J3 .EQ. 0) GO TO 440	WDTVORN	791
		N = NPDDR	WDTVORN	792
175		NREC = (N + 9) / 10	WDTVORN	793
		DO 410 NN = 1, NP	WDTVORN	794
		READ (5, 10) (PODRG (NN, 1), I = 1, 3)	WDTVORN	795
		DO 330 I = 1, 3	WDTVORN	796
	330	PODRG (NN, I) = PODRG (NN, I) / SKL	WDTVORN	797
180		I1 = -9	WDTVORN	798
		I2 = 0	WDTVORN	799
		DO 340 N1 = 1, NREC	WDTVORN	800
		I1 = I1 + 10	WDTVORN	801
		I2 = I2 + 10	WDTVORN	802
185		READ (5, 10) (XPOD (NN, I), I = I1, I2)	WDTVORN	803
		DO 340 I = I1, I2	WDTVORN	804
		XPOD (NN, I) = XPOD (NN, I) / SKL	WDTVORN	805
	340	CONTINUE	WDTVORN	806
		IF (J3 .NE. -1) GO TO 390	WDTVORN	807
190	C		WDTVORN	808
	C	ARBITRARILY DEFINED POD --READ NO. PTS FOR EACH STATION/POD	WDTVORN	809
	C		WDTVORN	810
		READ (5, 10) AN	WDTVORN	811
		NPTS (NN) = AN	WDTVORN	812
195		NPTS = NPTS (NN)	WDTVORN	813
		NCARD = (NPTS (NN) + 9) / 10	WDTVORN	814
	C		WDTVORN	815
	C	NCARD = NO. CARDS AT EACH STATION (1) FOR EACH POD (NN)	WDTVORN	816
	C		WDTVORN	817
200		DO 380 LN = 1, NPDDR	WDTVORN	818
	C		WDTVORN	819
	C	LN STATION LOOP	WDTVORN	820
	C		WDTVORN	821
		DO 370 K = 1, 2	WDTVORN	822
205		KK = K + (NN - 1) * 2	WDTVORN	823
		EY = 2 * K - 3	WDTVORN	824
		I1 = 10	WDTVORN	825
		I1 = -9	WDTVORN	826
		I2 = 0	WDTVORN	827
210		DO 360 NA = 1, NCARD	WDTVORN	828

SUBROUTINE START

74/74 OPT=1

FTN 4.6+452

78/04/19. 13.28.52

	IF (NA.EQ. NCARD) II = MOD (NPTSPS (NN), 10)	WDTVORN	829
	IF (II.EQ. 0) II = 10	WDTVORN	830
	I1 = I1 + 10	WDTVORN	831
	I2 = I2 + II	WDTVORN	832
215	READ (5, 10) (PDES (I, LN, K + (NN - 1) * 2), I = I1, I2)	WDTVORN	833
	DO 350 I = I1, I2	WDTVORN	834
	IF (PODDRG (NN, 2).EQ. 0.) GO TO 350	WDTVORN	835
	IF (I.EQ. NPTS) GO TO 250	WDTVORN	836
	PDES ((NPTS - 1) * 2 + I, LN, KK) = EY * PDES (I, LN, KK) / SKL +	WDTVORN	837
220	* PODDRG (NN, K + 1)	WDTVORN	838
	350 PDES (I, LN, K + (NN - 1) * 2) = PDES (I, LN, K + (NN - 1) * 2)	WDTVORN	839
	* /SKL + PODDRG (NN, K + 1)	WDTVORN	840
	360 CONTINUE	WDTVORN	841
	370 CONTINUE	WDTVORN	842
225	380 CONTINUE	WDTVORN	843
	LPF = 1	WDTVORN	844
	IF (PODDRG (NN, 2).NE. 0.) NPTSPS (NN) = NPTSPS (NN) * 2 - 1	WDTVORN	845
	GO TO 410	WDTVORN	846
	390 LPF = 0	WDTVORN	847
230	I1 = -9	WDTVORN	848
	I2 = 0	WDTVORN	849
	DO 400 N1 = 1, NREC	WDTVORN	850
	I1 = I1 + 10	WDTVORN	851
	I2 = I2 + 10	WDTVORN	852
235	READ (5, 10) (PODDRD (NN, I), I = I1, I2)	WDTVORN	853
	DO 400 I = I1, I2	WDTVORN	854
	PODDRD (NN, I) = PODDRD (NN, I) / SKL	WDTVORN	855
	400 CONTINUE	WDTVORN	856
	410 CONTINUE	WDTVORN	857
240	IF (LPF.EQ. 0) GO TO 440	WDTVORN	858
	DO 430 NN = 1, NP	WDTVORN	859
	C	WDTVORN	860
	C COMPUTE POD AREAS	WDTVORN	861
	C	WDTVORN	862
245	KK = 1 + (NN - 1) * 2	WDTVORN	863
	DO 420 I = 1, NPODDOR	WDTVORN	864
	PSI = 0.	WDTVORN	865
	NPTS = NPTSPS (NN)	WDTVORN	866
	DO 420 K = 2, NPTS	WDTVORN	867
250	ABAR = PDES (K - 1, I, KK) * PDES (K, I, KK + 1) - PDES (K, I, KK)	WDTVORN	868
	* * PDES (K - 1, I, KK + 1)	WDTVORN	869
	PSI = PSI + ABAR	WDTVORN	870

SUBROUTINE START

74/74 OPT=1

FTN 4.6+452

78/04/19. 13.28.52

	IF (1.EC. 1) PARNO (NN) = PSI	WDTVORN	871
	420 CONTINUE	WDTVORN	872
255	430 PARBA (NN) = PSI	WDTVORN	873
	C	WDTVORN	874
	C FINS	WDTVORN	875
	C	WDTVORN	876
	440 IF (J4.NE. 2) GO TO 450	WDTVORN	877
260	GO TO 480	WDTVORN	878
	450 IF (J4.EQ. 0) GO TO 480	WDTVORN	879
	N = NFINUR	WDTVORN	880
	DO 470 NN = 1, NF	WDTVORN	881
	READ (5, 10) ((FINORG (NN, I, J), J = 1, 4), I = 1, 2)	WDTVORN	882
265	DO 460 I = 1, 2	WDTVORN	883
	DO 460 J = 1, 4	WDTVORN	884
	460 FINORG (NN, I, J) = FINORG (NN, I, J) / SKL	WDTVORN	885
	READ (5, 10) (XFIN (NN, I), I = 1, N)	WDTVORN	886
	READ (5, 10) (FINORG (NN, I, J), J = 1, N)	WDTVORN	887
270	470 CONTINUE	WDTVORN	888
	C	WDTVORN	889
	C CANARDS	WDTVORN	890
	C	WDTVORN	891
	480 IF (J5.NE. 2) GO TO 490	WDTVORN	892
275	GO TO 540	WDTVORN	893
	490 IF (J5.EQ. 0) GO TO 540	WDTVORN	894
	N = IABS (NCANOR)	WDTVORN	895
	DO 530 NN = 1, NCAN	WDTVORN	896
	READ (5, 10) ((CANORG (NN, I, J), J = 1, 4), I = 1, 2)	WDTVORN	897
280	DO 500 I = 1, 2	WDTVORN	898
	DO 500 J = 1, 4	WDTVORN	899
	500 CANORG (NN, I, J) = CANORG (NN, I, J) / SKL	WDTVORN	900
	READ (5, 10) (XCAN (NN, I), I = 1, N)	WDTVORN	901
	READ (5, 10) (CANORD (NN, I, J), J = 1, N)	WDTVORN	902
285	IF (NCANOR.LT. 0) GO TO 520	WDTVORN	903
	DO 510 J = 1, N	WDTVORN	904
	DO 510 I = 1, 2	WDTVORN	905
	CANOR1 (NN, I, J) = CANORD (NN, I, J)	WDTVORN	906
	510 CONTINUE	WDTVORN	907
290	GO TO 530	WDTVORN	908
	520 READ (5, 10) (CANOR1 (NN, I, J), J = 1, N)	WDTVORN	909
	READ (5, 10) (CANOR1 (NN, 2, J), J = 1, N)	WDTVORN	910
	530 CONTINUE	WDTVORN	911
	NCANOR = IABS (NCANOR)	WDTVORN	912
295	540 RETURN	WDTVORN	913
	END	WDTVORN	914

SUBROUTINE LSTDT8

74/74 OPT=1

FTN 4.6+452

78/04/19. 13.28.52

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1      SUBROUTINE LSTDT8
      C
      DIMENSION A (20)
      WRITE (6, 40)
5      I = 0
20     READ (5, 50) A
      IF (EOF (5) .NE. 0) GO TO 30
      WRITE (6, 80) A
      I = I + 1
10     IF (I .NE. 44) GO TO 20
      WRITE (6, 60)
      GO TO 10
30     REWIND 5
      WRITE (6, 70)
      RETURN
15
40     FORMAT (1H1, 26HINPUT DATA LISTING FOLLOWS /1H )
50     FORMAT (20A4)
60     FORMAT (1H1)
70     FORMAT (1H0, 17HINPUT DATA LISTED)
20     FORMAT (1H , 20A4)
      END

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WDTVORN 925
WDTVORN 926
WDTVORN 927
WDTVORN 928
WDTVORN 929
WDTVORN 930
WDTVORN 931
WDTVORN 932
WDTVORN 933
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WDTVORN 942
WDTVORN 943
WDTVORN 944
WDTVORN 945

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SUBROUTINE TRANS

74/74 OPT=1

FTN 4.6+452

78/04/19. 13.28.52

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1      SUBROUTINE TRANS
        DIMENSION CARD(8)
10     READ(99, 20) CARD
20     FORMAT(8A10)
5      IF(EOF(99) .NE. 0) GO TO 30
        WRITE(5, 20) CARD
        GO TO 10
30     REWIND 5
        RETURN
10     END

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WDTVGRN	915
WDTVORN	916
WDTVORN	917
WDTVORN	918
WDTVORN	919
WDTVORN	920
WDTVORN	921
WDTVORN	922
WDTVORN	923
WDTVORN	924

APPENDIX B

LISTING OF MODIFICATIONS TO PROGRAM WDTVOR

DECK STATUS AND MODIFICATIONS.
DECK - WDTVORN

MODIFY - VER 1.2 76/04/21. 14.59.52.

WDTVORN MODIFIERS.

GLM

A	C	THIS PROGRAM HAS BEEN MODIFIED BY G. L. MARTIN (KENTRON) TO	GLM	1	6
A	C	INCORPORATE MULTISEGMENT FUSELAGES AND CORRECT PROGRAMMING ERRORS.	GLM	2	6
A	C	FOR INFORMATION CONCERNING THIS PROGRAM AND ITS CURRENT STATUS	GLM	3	6
A	C	CONTACT H. MEYSON (NASA LANGLEY).	GLM	4	6
A	C		GLM	5	6
D		IF (NFUS .GT. 0) NFUSP = 1	WDTVORN	134	
A		IF (NFUS .GT. 0) NFUSP = NFUS	GLM	6	134
D		GO TO (230, 230, 120), J2TEST	WDTVORN	207	
A		IF (J2TEST.EQ.2) GO TO 230	GLM	7	207
D		GO TO (140, 340, 140), J2TEST	WDTVORN	325	
A		IF (J2TEST.EQ.1) GO TO 340	GLM	8	325
A		GO TO 140	GLM	9	325
A		IF (NFUS.GT.1) GO TO 275	GLM	10	365
A	275	CONTINUE	GLM	11	369
D		SPC = 1.0	WDTVORN	375	
A		SPC=0.0	GLM	12	375
A		IF (NFUS.GT.1) GO TO 280	GLM	13	376
A	280	CONTINUE	GLM	14	378
A		IF (NFUS.GT.1) GO TO 295	GLM	15	390
A	295	CONTINUE	GLM	16	392
D		IF (J2TEST .EQ. 1) NAP = 0	WDTVORN	400	
A		IF (NFUS.GT.1) GO TO 298	GLM	17	403
A	298	CONTINUE	GLM	18	405
A		IF (NFUS.GT.1) GO TO 325	GLM	19	425
A	325	CONTINUE	GLM	20	427
A		IF (NFUS.GT.1) GO TO 331	GLM	21	434
D		WRITE (6, 630) (ZC1 2(JJ), JJ = 1, NAP)	WDTVORN	436	
A		WRITE (6, 630) (ZC12 (JJ), JJ = 1, NAP)	GLM	22	436
D		GO TO 380	WDTVORN	439	
A		IF (NFUS.EQ.1) GO TO 380	GLM	23	439
A	331	CONTINUE	GLM	24	439
A	C		GLM	25	439
A	C	FLK CIRCULAR FUSELAGES WITH MORE THAN 1 SEGMENT	GLM	26	439
A	C		GLM	27	439
A		DO 335 NSEG=1,NFUS	GLM	28	439
A	C		GLM	29	439
A	C	CARDS 7 + 8 OF OCTAGONAL FUSELAGE	GLM	30	439

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DECK STATUS AND MODIFICATIONS.
DECK - NOTVORN

MODIFY - VER 1.2 78/04/21. 14.59.52.

A	C		GLM	31	439
A		XFUSS1=XFUS(1,NSEG)	GLM	32	439
A		CORDF1=XFUS(NFORX(NSIG),NSEG)-XFUS(1,NSEG)	GLM	33	439
A		WRITE(13,770) XFUSS1,YFUSS1,ZFUSS1,CORDF1,NSEG	GLM	34	439
A		WRITE(6,780) XFUSS1,YFUSS1,ZFUSS1,CORDF1,NSEG	GLM	35	439
A		WRITE(13,770) XFUSS1,YFUSS1,ZFUSS2,CORDF1,NSEG	GLM	36	439
A		WRITE(6,780) XFUSS1,YFUSS1,ZFUSS2,CORDF1,NSEG	GLM	37	439
A	C		GLM	38	439
A	C	CARD 9 (SUB PANEL CONTROLS OF OCTAGONAL FUSELAGE)	GLM	39	439
A	C		GLM	40	439
A		RNCV=NFORX(NSIG)-1.	GLM	41	439
A		WRITE(13,560) TNVER,RNCV,SPC,CURV	GLM	42	439
A		WRITE(6,590) TNVER,RNCV,SPC,CURV	GLM	43	439
A	C		GLM	44	439
A	C	POLAR COORDINATES FOR REFERENCE OCTAGON	GLM	45	439
A	C		GLM	46	439
A		WRITE(13,620)((PHI(JK),RHORL),JK=1,5)	GLM	47	439
A		WRITE(6,630)((PHI(JK),RHORL),JK=1,5)	GLM	48	439
A	C		GLM	49	439
A	C	CARD 11 (ADDITIONAL CONTROL PARAMETERS)	GLM	50	439
A	C		GLM	51	439
A		NAP=NFORX(NSEG)	GLM	52	439
A		WRITE(13,600) AINC1,AINC2,ITS,NAP,IQUANT,ISYNT,NPP	GLM	53	439
A		WRITE(6,610) AINC1,AINC2,ITS,NAP,IQUANT,ISYNT,NPP	GLM	54	439
A		IF(NAP.LE.2) GO TO 335	GLM	55	439
A	C		GLM	56	439
A	C	CARD 14 (PERCENT LENGTH OF SEGMENT)	GLM	57	439
A	C		GLM	58	439
A		XFUSN=XFUS(NAP,NSEG)	GLM	59	439
A		PJ=3.14159265	GLM	60	439
A		JJ=1	GLM	61	439
A		DO 333 LUP=1,NAP	GLM	62	439
A		XFPCT(JJ)=(XFUS(LUP,NSEG)-XFUS(1,NSEG))/(XFUSN-XFUS(1,NSEG))*100.	GLM	63	439
A		ZC12(JJ)=ZFUS(LUP,NSEG)/(XFUSN-XFUS(1,NSEG))*100.	GLM	64	439
A		FUSRAD(LUP,NSEG)=SQRT(FUSARD(LUP,NSEG)/PI)	GLM	65	439
A		RUFUS(JJ)=FUSRAD(LUP,NSEG)	GLM	66	439
A		JJ=JJ+1	GLM	67	439
A	333	CONTINUE	GLM	68	439
A		WRITE(13,620)(XFPCT(J),J=1,NAP)	GLM	69	439
A		WRITE(6,630)(XFPCT(J),J=1,NAP)	GLM	70	439
A	C		GLM	71	439

DECK STATUS AND MODIFICATIONS.
DECK - WDTVORN

MODIFY - VER 1.2

78/04/21. 14.59.53.

A	C	CARD 16 (ARIA PATINS WRT REFERENCE OCTAGON)	GLM	72	439
A	C		GLM	73	439
A		DE 334 LL=1,NAP	GLM	74	439
A		REFUS(LL)=(REFUS(LL)/FHCREF)*+2*100.	GLM	75	439
A	334	CONTINUE	GLM	76	439
A		WRITE(L3,620)(ZC12(JJ),JJ=1,NAP)	GLM	77	439
A		WRITE(6,630)(ZC12(JJ),JJ=1,NAP)	GLM	78	439
A		WRITE(L3,620)(REFUS(LL),LL=1,NAP)	GLM	79	439
A		WRITE(6,630)(REFUS(LL),LL=1,NAP)	GLM	80	439
A	335	CONTINUE	GLM	81	439
A		GO TO 360	GLM	82	439
A	770	FORMAT (4F10.4, 10X, 18HFUSFLAGE PANEL NO., I2)	GLM	83	617
A	780	FORMAT (1H, 4F10.4, 10X, 18HFUSFLAGI PANEL NO., I2)	GLM	84	617
A		SKL=1.	GLM	85	643
D		GO TO 110	WDTVORN	651	
A		GO TO 140	GLM	86	651
A		IF (J1.EQ. 1) WAFURG (NN,3) = WAFURG (NN,3) + TZORD (NN,1)	GLM	87	676
A		DO 55 I = 1, N,AFCF	GLM	88	676
A		IF (J1.EQ. 1) TZORD (NN,I) = TZORD (NN,I) - TZORD (NN,1)	GLM	89	676
A	55	CONTINUE	GLM	90	676
D		DO 270 NFU = 1, NFUS	WDTVORN	724	
A		DO 305 NFU=1,NFUS	GLM	91	724
D		GO TO 310	WDTVORN	774	
A		GO TO 305	GLM	92	774
A	305	CONTINUE	GLM	93	786

APPENDIX C
SOURCE LISTING OF MODIFIED PROGRAM WDTVOR

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1	PROGRAM WDTVORN(INPUT,OUTPUT,TAPE99=INPUT,TAPE6=OUTPUT,TAPE5,	WDTVORN	1
	1 TAPE3)	WDTVORN	2
	CONTROLL*VRLX,WDTVORN	9/29/76 WDTVORN	3
	C	WDTVORN	4
5	C...THIS PROGRAM IS BASED ON NASA LRC PROGRAM D2500 -- HAVE DRAG	WDTVORN	5
	C	WDTVORN	6
	C THIS PROGRAM HAS BEEN MODIFIED BY G. L. MARTIN (KENTRON) TO	GLM	1
	C INCORPORATE MULTISEGMENT FUSELAGES AND CORRECT PROGRAMMING ERRORS.	GLM	2
	C FOR INFORMATION CONCERNING THIS PROGRAM AND ITS CURRENT STATUS	GLM	3
10	C CONTACT H. HEYSON (NASA LANGLEY).	GLM	4
	C	GLM	5
	C COMMON ABC (20), JO, J1, J2, J3, J4, J5, J6, NWAFF, NWAFOR, NFUS,	WDTVORN	7
	* NFAUX (4), NFURX (4), NF, NPODER, NF, NFINDR, NCAN, NCANOR,	WDTVORN	8
	* J2TIST, LFER, NRICH, REFA, NCASE, XHACH, NX, NTHETA, NREST,	WDTVORN	9
15	* XFEET (10), S&L	WDTVORN	10
	C COMMON/BLK2/V, XFUS1, XFUSN	WDTVORN	11
	C COMMON/BLACK/AAF (30), WAFDRG (20, 4), WAFORD (20, 3, 30),	WDTVORN	12
	* T2PFD (20, 30), XFUS (30, 4), ZFUS (30, 4), SFUS (30, 30, 1),	WDTVORN	13
	* FLSARD (30, 4), FUSRD (130, 4), PODORG (9, 3), XPOD (9, 30),	WDTVORN	14
20	* PODRL (9, 30), N15PS (5), PDS (30, 30, 10), FINORG (6, 2, 4),	WDTVORN	15
	* XFIN (6, 10), FINRD (6, 2, 10), CANORG (2, 2, 4), XCAN (2, 10),	WDTVORN	16
	* CANCRD (2, 2, 10), CANUR1 (2, 2, 10)	WDTVORN	17
	C	WDTVORN	18
	C DIMENSION ALPHA (7), YFUSMX (4, 30), AFUS (4, 29), XFPCT (50),	WDTVORN	19
25	* ZC12 (50), FDFUS(50)	WDTVORN	20
	C DIMENSION ABCD (20)	WDTVORN	21
	C DIMENSION ZCPI2 (9, 30), PHI (10)	WDTVORN	22
	C	WDTVORN	23
	C INTEGER FUSTYP	WDTVORN	24
30	C	WDTVORN	25
	C DATA L3 /3/	WDTVORN	26
	C DTH = .017453	WDTVORN	27
	C CALL TRANS	WDTVORN	28
	C CALL LSTDT8	WDTVORN	29
35	C FUSTYP = 0	WDTVORN	30
	C NSWVR = 20	WDTVORN	31
	C	WDTVORN	32
	C READ NAMELIST CARDS	WDTVORN	33
	C	WDTVORN	34
40	C NAMELIST /INPUT/FUSTYP, NSWVR	WDTVORN	35
	C READ (5, INPUT)	WDTVORN	36
	C IF (GLF (5) .NE. 0) GO TO 760	WDTVORN	37

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	C		WDTVORN	38
	C	INPUT 1ST TWO CARDS (TITLE CARD ^ CONTROL FLAGS)	WDTVORN	39
40	C		WDTVORN	40
	10	FORMAT (20A4)	WDTVORN	41
		READ (5, 10) ABC	WDTVORN	42
	20	FORMAT (1H1, 20A4)	WDTVORN	43
		READ (5, 30) J0, J1, J2, J3, J4, J5, J6, NNAF, NNAFOR, NFUS,	WDTVORN	44
50		* (NFA0X (1), NFA0X (1), 1 = 1, 4), NP, NPDOR, NF, NFINOR,	WDTVORN	45
		* NCAN, NCATON	WDTVORN	46
	30	FORMAT (24I3)	WDTVORN	47
	C		WDTVORN	48
	C	INPUT CONFIGURATION DESCRIPTION AND INITIALIZE	WDTVORN	49
55	C		WDTVORN	50
		CALL STAPT	WDTVORN	51
		NNID1 = 0	WDTVORN	52
	C		WDTVORN	53
	C	INPUT CASE CARD	WDTVORN	54
60	C		WDTVORN	55
		READ (5, 40) NCASE, MACH, NX, NTHETA, NREST, NCON, NPLT	WDTVORN	56
		KEY = 0	WDTVORN	57
	40	FORMAT (A4, 5I4, 8I1)	WDTVORN	58
		XNACH = FLGAT (MACH) / 1000.	WDTVORN	59
65		LEPR = 0	WDTVORN	60
	C		WDTVORN	61
	C	INPUT CONSTRAINT POINTS	WDTVORN	62
	C		WDTVORN	63
		IF (.NOT. (NMODE .EQ. 0 .AND. NREST .NE. 0)) GO TO 70	WDTVORN	64
70		READ (5, 50) XREST	WDTVORN	65
	50	FORMAT (10F7.0)	WDTVORN	66
		DO 60 I = 1, 10	WDTVORN	67
		XREST (I) = XREST (I) / SKL	WDTVORN	68
	60	CONTINUE	WDTVORN	69
75		NMODE = 1	WDTVORN	70
	70	CONTINUE	WDTVORN	71
	C		WDTVORN	72
	C	IF VORLAX SOME 19 CARDS ARE DESCRIBED. HOWEVER, THIS DOES NOT MEAN	WDTVORN	73
	C	THAT INPUT FOR A CASE CONSISTS OF 19 CARDS. RATHER THESE SHOULD BE	WDTVORN	74
80	C	THOUGHT OF AS ECARD TYPES.1 FURTHERMORE, NOT ALL CARD TYPES WILL	WDTVORN	75
	C	BE INCLUDED IN A GIVEN CASE, THOSE TO BE INCLUDED OR DELETED	WDTVORN	76
	C	BEING A FUNCTION OF SOME OF THE INPUT CONTROL VALUES.	WDTVORN	77
	C		WDTVORN	78
	C	THE FOLLOWING CARD NUMBERS ARE COMPATIBLE WITH THE VORLAX INPUT	WDTVORN	79

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85	C	FORMAT AND A COMPLETE DESCRIPTION CAN BE FOUND IN THE VORLAX PROGRAM	WDTVORN	80
	C	MANUAL LR 26259 SECTION 3.2.	WDTVORN	81
	C		WDTVORN	82
	C	START CONSTRUCTION OF VORLAX DATASET	WDTVORN	83
	C	PUTTING OUT TITLE CARD 1	WDTVORN	84
90	C		WDTVORN	85
		WRITE (L3, 10) ABC	WDTVORN	86
		WRITE (6, 20) ABC	WDTVORN	87
	C		WDTVORN	88
	C	SETTING UP FOR CARD 2 (CONTROLS)	WDTVORN	89
95	C		WDTVORN	90
		ISOLV = 0	WDTVORN	91
		LAX = 0	WDTVORN	92
		LAY = 1	WDTVORN	93
		REXPAN = -.02	WDTVORN	94
100		HAG = 0.0	WDTVORN	95
		FLOATX = 0.0	WDTVORN	96
		FLOATY = 0.0	WDTVORN	97
		IBLEN = 0	WDTVORN	98
		ITPMAX = 0	WDTVORN	99
105		WRITE (L3, 500) ISOLV, LAX, LAY, REXPAN, HAG, FLOATX, FLOATY,	WDTVORN	100
		* IBCUN, ITPMAX	WDTVORN	101
		WRITE (6, 510) ISOLV, LAX, LAY, REXPAN, HAG, FLOATX, FLOATY,	WDTVORN	102
		* IBCUN, ITPMAX	WDTVORN	103
	C		WDTVORN	104
110	C	SET UP FOR CARD 3 (MACH NUMBERS)	WDTVORN	105
	C		WDTVORN	106
		NMACH = 1	WDTVORN	107
		WRITE (L3, 520) NMACH, XMACH	WDTVORN	108
		WRITE (6, 530) NMACH, XMACH	WDTVORN	109
115	C		WDTVORN	110
	C	SET UP FOR CARD 4 (ALPHAS)	WDTVORN	111
	C		WDTVORN	112
		NALPHA = 3	WDTVORN	113
		ALPHA (1) = 0.	WDTVORN	114
120		ALPHA (2) = 5.	WDTVORN	115
		ALPHA (3) = 10.	WDTVORN	116
		WRITE (L3, 520) NALPHA, (ALPHA (I), I = 1, NALPHA)	WDTVORN	117
		WRITE (6, 530) NALPHA, (ALPHA (I), I = 1, NALPHA)	WDTVORN	118
	C		WDTVORN	119
125	C	SET UP FOR CARD 5 (ASYMMETRIC CONTROLS)	WDTVORN	120
	C		WDTVORN	121

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	LATRAL = 0	WDTVORN	122
	PSI = 0	WDTVORN	123
	PITCHQ = 0	WDTVORN	124
130	POLLO = 0	WDTVORN	125
	YAWQ = 0	WDTVORN	126
	VINF = 0	WDTVORN	127
	WRITE (13, 520) LATRAL, PSI, PITCHQ, POLLO, YAWQ, VINF	WDTVORN	128
	WRITE (6, 530) LATRAL, PSI, PITCHQ, POLLO, YAWQ, VINF	WDTVORN	129
135	C	WDTVORN	130
	C SET UP FOR CARD 6 (REFERENCE DIMENSIONS)	WDTVORN	131
	C	WDTVORN	132
	NFUSP = 0	WDTVORN	133
	IF (NFUS .GT. 0) NFUSP = NFUS	GLH	6
140	NPAN = NPAF - 1 + NF + NCAN + NFUSP + NP	WDTVORN	135
	SREF = KEFA	WDTVORN	136
	CBAR = 1.0	WDTVORN	137
	XBAR = 0.	WDTVORN	138
	ZBAR = 0.	WDTVORN	139
145	WSPAN = WAFDNG (NPAF, 2) * 2.0	WDTVORN	140
	WRITE (13, 540) NPAN, SREF, CBAR, XBAR, ZBAR, WSPAN	WDTVORN	141
	WRITE (6, 550) NPAN, SREF, CBAR, XBAR, ZBAR, WSPAN	WDTVORN	142
	C	WDTVORN	143
	C WING TREATMENT	WDTVORN	144
150	C	WDTVORN	145
	C SET UP FOR CARDS 7 (COORDS. OF ONE SIDE OF MAJOR PANEL)	WDTVORN	146
	C	WDTVORN	147
	IF (J1 .EQ. 0) GO TO 110	WDTVORN	148
	NWPAN = NPAF - 1	WDTVORN	149
155	DO 90 NN = 1, NPAF	WDTVORN	150
	DO 80 II = 1, NPAFOR	WDTVORN	151
	TZJPD (NN, II) = TZJPD (NN, II) / WAFDNG (NN, 4) * 100.	WDTVORN	152
	90 CONTINUE	WDTVORN	153
	90 CLATINUI	WDTVORN	154
160	DO 100 JJ = 1, NWPAN	WDTVORN	155
	WRITE (13, 560) (WAFDNG (IT, JJ), J = 1, 4), IT	WDTVORN	156
	WRITE (6, 570) (WAFDNG (IT, JJ), J = 1, 4), IT	WDTVORN	157
	C	WDTVORN	158
	C SETTING UP FOR CARD 8 (COORDS. OF OTHER SIDE OF MAJOR WING PANEL)	WDTVORN	159
165	C	WDTVORN	160
	WRITE (13, 560) (WAFDNG (IT + 1, JJ), J = 1, 4), IT	WDTVORN	161
	WRITE (6, 570) (WAFDNG (IT + 1, JJ), J = 1, 4), IT	WDTVORN	162
	C	WDTVORN	163

170	C	SETTING UP FOR CARD 9 (WING SUB PANEL CONTROLS)	WDTVORN	164
	C		WDTVORN	165
		INVR = 3.0	WDTVORN	166
		RNCV = 10.	WDTVORN	167
		SPC = 1.	WDTVORN	168
		CURV = 0.	WDTVORN	169
175		WRITE (L3, 500) INVR, RNCV, SPC, CURV	WDTVORN	170
		WRITE (6, 500) INVR, RNCV, SPC, CURV	WDTVORN	171
	C		WDTVORN	172
	C	SETTING UP FOR CARD 11 (ADDITIONAL WING CONTROL PARAMETERS)	WDTVORN	173
180	C		WDTVORN	174
		AINC1 = 0.	WDTVORN	175
		AINC2 = 0.	WDTVORN	176
		ITS = 0	WDTVORN	177
		NAP = NWAFOR	WDTVORN	178
		ICLANT = 0	WDTVORN	179
185		ISYNT = 0	WDTVORN	180
		NPP = 0	WDTVORN	181
		WRITE (L3, 600) AINC1, AINC2, ITS, NAP, IQANT, ISYNT, NPP	WDTVORN	182
		WRITE (6, 610) AINC1, AINC2, ITS, NAP, IQANT, ISYNT, NPP	WDTVORN	183
190	C		WDTVORN	184
	C	SETTING UP FOR CARD 14 (WING PER CENT CHORD STATIONS)	WDTVORN	185
	C		WDTVORN	186
		IF (NAP .EQ. 0) GO TO 110	WDTVORN	187
		WRITE (L3, 620) (XAF (J), J = 1, NAP)	WDTVORN	188
		WRITE (6, 630) (XAF (J), J = 1, NAP)	WDTVORN	189
195	C		WDTVORN	190
	C	SETTING UP FOR CARD 16 (WING CAMBER ORDINATES)	WDTVORN	191
	C		WDTVORN	192
		WRITE (L3, 640) (TZORD (IT, JJ), JJ = 1, NWAFOR)	WDTVORN	193
		WRITE (6, 650) (TZORD (IT, JJ), JJ = 1, NWAFOR)	WDTVORN	194
200		WRITE (L3, 640) (TZORD (IT + 1, JJ), JJ = 1, NWAFOR)	WDTVORN	195
		WRITE (6, 650) (TZORD (IT + 1, JJ), JJ = 1, NWAFOR)	WDTVORN	196
		100 CONTINUE	WDTVORN	197
	C		WDTVORN	198
205	C	FUSELAGE TREATMENT	WDTVORN	199
	C		WDTVORN	200
		110 IF (J2 .EQ. 0) GO TO 360	WDTVORN	201
	C		WDTVORN	202
	C	J2TEST = 1 FUSELAGE IS CIRCULAR AND UNCAMBERED	WDTVORN	203
	C	J2TEST = 2 FUSELAGE IS CIRCULAR AND CAMBERED	WDTVORN	204
210	C	J2TEST = 3 FUSELAGE IS ARBITRARY IN CROSS SECTION	WDTVORN	205

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	C	IF (JPTLST.LI.2) GO TO 230	WDTVORN	206
	C		GLH	7
	C	TREATMENT OF ARBITRARY FUSELAGE SECTIONS	WDTVORN	208
215	C	GETTING THE MAX Y VALUE AT EACH STATION	WDTVORN	209
	C		WDTVORN	210
	120	DO 130 KI = 1, NFUS	WDTVORN	211
		KISS = MFCLX (KI)	WDTVORN	212
		KUSS = MPALX (KI)	WDTVORN	213
220		DO 130 LN = 1, KISS	WDTVORN	214
		DO 130 IF = 1, KUSS	WDTVORN	215
		KEY = 2 * (KI - 1) + 1	WDTVORN	216
		IF (IC .EQ. 1) TEMP = 0.	WDTVORN	217
		IF (IC .GT. 1) TEMP = YFUSMX (KI, LN)	WDTVORN	218
225		IF (IC .EQ. NRADX (KI)) GO TO 130	WDTVORN	219
		YFUSMX (KI, LN) = AMAX1 (SFUS (IC, LN, KEY), TEMP)	WDTVORN	220
	130	CONTINUE	WDTVORN	221
	C		WDTVORN	222
230	C	GETTING THE INCREMENTAL FUSELAGE PLANFORM AREAS	WDTVORN	223
	C		WDTVORN	224
	140	DO 160 KI = 1, NFUS	WDTVORN	225
		KISS = MFCLX (KI) - 1	WDTVORN	226
		DO 150 LN = 1, KISS	WDTVORN	227
		AFUS (KI, LN) = (YFUSMX (KI, LN + 1) + YFUSMX (KI, LN))	WDTVORN	228
235		* ((XIFUS (LN + 1, KI) - XFUS (LN, KI)) / 2.0	WDTVORN	229
	150	CONTINUE	WDTVORN	230
	160	CONTINUE	WDTVORN	231
	C		WDTVORN	232
240	C	SOLVING FOR ZERO THICKNESS FUSELAGE PANEL COORDINATES	WDTVORN	233
	C		WDTVORN	234
		XNID = WAFORG (1, 1) + WAFORG (1, 4) / 2.0	WDTVORN	235
		DO 170 KI = 1, NFUS	WDTVORN	236
		KISS = MFCLX (KI)	WDTVORN	237
		DO 170 LN = 1, KISS	WDTVORN	238
245		DXPID = XNID - XFUS (LN, KI)	WDTVORN	239
		IF (DXPID .LE. 0.) GO TO 190	WDTVORN	240
	170	CONTINUE	WDTVORN	241
	180	CONTINUE	WDTVORN	242
	190	KIMID = KI	WDTVORN	243
250		LNPID = LN	WDTVORN	244
		XDIV = XFUS (LNPID, KIMID)	WDTVORN	245
	C		WDTVORN	246
			WDTVORN	247

	C	INTEGRATE ARIAS OF FWD FUSELAGE	WDTVORN	248
	C		WDTVORN	249
255		A1 = 0.	WDTVORN	250
		DO 200 KI = 1, KIMID	WDTVORN	251
		KISS = NFORK (KI) -1	WDTVORN	252
		IF (KI .EQ. KIMID) KISS = LNMID -1	WDTVORN	253
		DO 200 LM = 1, KISS	WDTVORN	254
260		A1 = A1 + AFUS (KI, LM)	WDTVORN	255
	200	CONTINUE	WDTVORN	256
		DX1 = 2.0 *A1 /WAFDRG (1, 2) - (XDIV - XFUS (1, 1))	WDTVORN	257
		XORF = XDIV - DX1	WDTVORN	258
	C		WDTVORN	259
265	C	INTEGRATE ARIAS OF AFT FUSELAGE PLANFORM	WDTVORN	260
	C		WDTVORN	261
		A2 = 0.	WDTVORN	262
		DO 220 KI = KIMID, NFUS	WDTVORN	263
		KISS = NFORK (KI) -1	WDTVORN	264
270		DO 210 LM = LNMID, KISS	WDTVORN	265
		A2 = A2 + AFUS (KI, LM)	WDTVORN	266
	210	CONTINUE	WDTVORN	267
	220	CONTINUE	WDTVORN	268
		DX2 = 2.0 *A2 /WAFDRG (1, 2) - XFUS (NFORK (NFUS), NFUS) + XDIV	WDTVORN	269
275		XFUSS1 = XFUS (1, 1)	WDTVORN	270
		YFUSS1 = YFUSMA (1, 1)	WDTVORN	271
		ZFUSS = WAFDRG (1, 3)	WDTVORN	272
		CORDF1 = XFUS (NFORK (NFUS), NFUS) - XFUS (1, 1)	WDTVORN	273
		XFUSS2 = XINE	WDTVORN	274
280		YFUSS2 = WAFDRG (1, 2)	WDTVORN	275
		CORDF2 = DX1 + DX2	WDTVORN	276
	C		WDTVORN	277
	C	CARD 7 OF FUSELAGE PANEL (COORDS. OF FUSELAGE PANEL CENTER LINE)	WDTVORN	278
	C		WDTVORN	279
285		WRITE (13, 720) XFUSS1, YFUSS1, ZFUSS, CORDF1	WDTVORN	280
		WRITE (6, 730) XFUSS1, YFUSS1, ZFUSS, CORDF1	WDTVORN	281
	C		WDTVORN	282
	C	CARD 8 OF FUSELAGE PANEL (COORDS. OF FUSEL. PANEL AT WING JUNCTURE)	WDTVORN	283
	C		WDTVORN	284
290		WRITE (13, 720) XFUSS2, YFUSS2, ZFUSS, CORDF2	WDTVORN	285
		WRITE (6, 730) XFUSS2, YFUSS2, ZFUSS, CORDF2	WDTVORN	286
	C		WDTVORN	287
	C	CARD 9 OF FUSELAGE (SUB PANELLING CONTROLS)	WDTVORN	288
	C		WDTVORN	289

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245	TMVDF = 3.	WDTVORN	290
	RMCV = 7.0	WDTVORN	291
	SPC = 1.	WDTVORN	292
	CELV = 0.	WDTVORN	293
	WRITE (13, 540) TMVDF, RMCV, SPC, CURV	WDTVORN	294
300	WRITE (6, 540) TMVDF, RMCV, SPC, CURV	WDTVORN	295
	C	WDTVORN	296
	C SET UP FOR CASE 11 (ADDITIONAL CONTROL PARAMETERS FOR FUSELAGE)	WDTVORN	297
	C	WDTVORN	298
	AINC1 = 0.	WDTVORN	299
305	AINC2 = 0.	WDTVORN	300
	JITS = 0	WDTVORN	301
	NAP = 0	WDTVORN	302
	IF (J2TEST.EQ.0) NAP=NFORX(1)+NFORX(2)+NFORX(3)+NFORX(4)-NFUS+1	WDTVORN	303
	IQUANT = 0	WDTVORN	304
310	ISYNT = 0	WDTVORN	305
	NPP = 0	WDTVORN	306
	WRITE (13, 600) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP	WDTVORN	307
	WRITE (6, 610) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP	WDTVORN	308
	IF (NAP.NE.0) GO TO 360	WDTVORN	309
315	C	WDTVORN	310
	C	WDTVORN	311
	GE TO 360	WDTVORN	312
	C	WDTVORN	313
	C START OF CIRCULAR FUSELAGE TREATMENT	WDTVORN	314
320	C	WDTVORN	315
	230 DO 240 KI = 1, NFUS	WDTVORN	316
	KISS = NFORX (KI)	WDTVORN	317
	DO 240 LN = 1, KTSS	WDTVORN	318
	YFUSPX (KI, LN) = FUSPAD (LN, KI)	WDTVORN	319
325	240 CONTINUE	WDTVORN	320
	C	WDTVORN	321
	C IF CIRCULAR FUSELAGE IS CAMBERED THEN GO TO GET FUSE. CAMBER ORDS.	WDTVORN	322
	C	WDTVORN	323
	IF (FUSTYP.EQ.1) GO TO 250	WDTVORN	324
330	IF (J2TEST.EQ.1) GO TO 340	GLH	8
	GO TO 140	GLH	9
	C	WDTVORN	326
	C BEGIN OCTAGONAL FUSELAGE TREATMENT	WDTVORN	327
	C	WDTVORN	328
335	250 XFUS1 = XFLS (1, 1)	WDTVORN	329
	C	WDTVORN	330

	C	DETERMINE WHICH TWO FUSE STNS BRACKET X OF WING ROOT L E	WDTVORN	331
	C		WDTVORN	332
340		ON 260 KI = 1, NFUS	WDTVORN	333
		KISS = NFUSX (KI)	WDTVORN	334
		ON 260 LN = 1, KISS	WDTVORN	335
		DXWLE = WAFORG (1,1) - XFUS (LN, KI)	WDTVORN	336
		IF (DXWLE .LE. 0) GO TO 270	WDTVORN	337
	260	CONTINUE	WDTVORN	338
345	270	XAIT = XFUS (LN, KI)	WDTVORN	339
		IF (LN .GT. 1) XFWD = XFUS (LN-1, KI)	WDTVORN	340
		IF (LN .EQ. 1) XFWD = XFUS (KISS, KI - 1)	WDTVORN	341
	C		WDTVORN	342
350	C	DETERMINE FUSELAGE CAMBER AT WING ROOT L E	WDTVORN	343
	C		WDTVORN	344
		ZAFT = ZFUS (LN, KI)	WDTVORN	345
		IF (LN .GT. 1) ZFWD = ZFUS (LN-1, KI)	WDTVORN	346
		IF (LN .EQ. 1) ZFWD = ZFUS (KISS, KI - 1)	WDTVORN	347
		SLOPE = (ZAFT - ZFWD) / (XAFT - XFWD)	WDTVORN	348
355		ZFWLE = ZFWD + (WAFORG (1,1) - XFWD) * SLOPE	WDTVORN	349
	C		WDTVORN	350
	C	DETERMINE PHI ^ RHO FROM FUSE C-LINE TO WING L E ROOT	WDTVORN	351
	C		WDTVORN	352
360		RHORIF = SQRT ((WAFORG (1,3) - ZFWLE) **2 + WAFORG (1,2) **2)	WDTVORN	353
		PHIRIF = ATAN ((WAFORG (1,3) - ZFWLE) / WAFORG (1,2)) / DTR	WDTVORN	354
	C		WDTVORN	355
	C	SET OF CARDS 7 ^ 8 OF OCTAGONAL FUSELAGE	WDTVORN	356
	C		WDTVORN	357
365		XFUSS1 = XFUS (1,1)	WDTVORN	358
		YFUSS1 = 0.	WDTVORN	359
		ZFUSS1 = ZFWLE + PHORIF	WDTVORN	360
		ZFUSS2 = ZFWLE - PHORIF	WDTVORN	361
		CORDF1 = XFUS (NFUSX (NFUS), NFUS) - XFUS (1,1)	WDTVORN	362
370	C		WDTVORN	363
	C	CARD 7 ^ 8 OF OCTAGONAL FUSELAGE	WDTVORN	364
	C		WDTVORN	365
		IF (NFUS .GT. 1) GO TO 275	GLH	10
		WRITE (13,720) XFUSS1, YFUSS1, ZFUSS1, CORDF1	WDTVORN	366
375		WRITE (6,730) XFUSS1, YFUSS1, ZFUSS1, CORDF1	WDTVORN	367
		WRITE (13,720) XFUSS1, YFUSS1, ZFUSS2, CORDF1	WDTVORN	368
		WRITE (6,730) XFUSS1, YFUSS1, ZFUSS2, CORDF1	WDTVORN	369
	275	CONTINUE	GLH	11
	C		WDTVORN	370

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	C	CARD 9 (SUB PANEL CONTROLS OF OCTAGONAL FUSELAGE)	WDTVORN	371
380	C		WDTVORN	372
		TNVCR = 4	WDTVORN	373
		RNCV = NFURX (1) + NFURX (2) + NFURX (3) + NFURX (4) - NFUS	WDTVORN	374
		SFL=0.0	GLM	12
		CURV = 449.	WDTVORN	376
385		IF(NFUS.GT.1) GO TO 280	GLM	13
		WRITE (13, 580) TNVCR, RNCV, SPC, CURV	WDTVORN	377
		WRITE(6, 590) TNVCR, RNCV, SPC, CURV	WDTVORN	378
	280	CONTINUE	GLM	14
	C		WDTVORN	379
390	C	SLT UP POLAR COORDINATES FOR REFERENCE OCTAGON	WDTVORN	380
	C		WDTVORN	381
		DUPER = 90 - PHIRFF	WDTVORN	382
		PANUP = DUPER / 45	WDTVORN	383
		IPANUP = PANUP + .5	WDTVORN	384
395		DPHEU = DUPER / IPANUP	WDTVORN	385
		DPHLC = (180 - DUPER) / (4 - IPANUP)	WDTVORN	386
		DO 290 JK=1,5	WDTVORN	387
		IF (JK .LE. IPANUP) PHI (JK) = 90 - (JK - 1) * DPHEU	WDTVORN	388
		IF (JK .GT. IPANUP) PHI (JK) = 90 - IPANUP * DPHEU - DPHLC * (JK - 1 - IPANUP)	WDTVORN	389
400	290	CONTINUE	WDTVORN	390
		IF(NFUS.GT.1) GO TO 295	GLM	15
		WRITE (13, 620) ((PHI (JK), RHJREF), JK = 1, 5)	WDTVORN	391
		WRITE (6, 630) ((PHI(JK), RHOREF), JK = 1, 5)	WDTVORN	392
	295	CONTINUE	GLM	16
405	C		WDTVORN	393
	C	SET UP FOR CARD 11 OF OCTAGONAL FUSEL (ADDITIONAL CONTROL PARAMETERS)	WDTVORN	394
	C		WDTVORN	395
		AINC1 = 0.	WDTVORN	396
		AINC2 = 0.	WDTVORN	397
410		ITS = 1	WDTVORN	398
		NAP = RNCV + 1	WDTVORN	399
		IOUANT = 0	WDTVORN	401
		ISYNT = 0	WDTVORN	402
		NPP = 1	WDTVORN	403
415		IF(NFUS.GT.1) GO TO 296	GLM	17
		WRITE (13, 600) AINC1, AINC2, ITS, NAP, IOUANT, ISYNT, NPP	WDTVORN	404
		WRITE(6, 610) AINC1, AINC2, ITS, NAP, IOUANT, ISYNT, NPP	WDTVORN	405
	296	CONTINUE	GLM	18
		IF (NAP .EQ. 0) GO TO 380	WDTVORN	406
420	C		WDTVORN	407

	C CARD 14 OF OCTAGONAL FUSFLAGE (PERCENT LENGTH STATION OF FUSELAGE)	WDTVDRH	408
	C	WDTVDRH	409
	JJ = 1	WDTVDRH	410
	DO 310 KI = 1, NFUS	WDTVDRH	411
425	KISS = NFKRX (KI) - 1	WDTVDRH	412
	IF (KI .EQ. NFUS) KISS = NFKRX (NFUS)	WDTVDRH	413
	DO 300 LN = 1, KISS	WDTVDRH	414
	XFPCT (JJ) = XFUS (LN, KI) / (XFUSN - XFUS1) * 100.	WDTVDRH	415
	ZC12 (JJ) = ZFUS (LN, KI) / (XFUSN - XFUS1) * 100.	WDTVDRH	416
430	RDFUS (JJ) = FUSRAD (LN, KI)	WDTVDRH	417
	JJ = JJ + 1	WDTVDRH	418
	300 CONTINUE	WDTVDRH	419
	310 CONTINUE	WDTVDRH	420
	DO 320 JJ = 1, NAP	WDTVDRH	421
435	IF ((XFPCT(JJ+1)*(XFUSN-XFUS1)/100.) .GT. WAFORG (1,1) .AND.	WDTVDRH	422
	* (XFPCT(JJ-1)*(XFUSN-XFUS1)/100.) .LT.	WDTVDRH	423
	* (WAFORG (1,1) + WAFORG (1,4))) RDFUS (JJ) = RHOREF	WDTVDRH	424
	320 CONTINUE	WDTVDRH	425
	IF (NFUS .GT. 1) GO TO 325	GLM	19
440	WRITE (13, 620) (XFPCT (J), J = 1, NAP)	WDTVDRH	426
	WRITE (6, 630) (XFPCT (J), J = 1, NAP)	WDTVDRH	427
	325 CONTINUE	GLM	20
	C	WDTVDRH	428
	C SETTING UP FOR CARD 16 OF OCTAGONAL FUSELAGE (AREA RATIOS WRT.	WDTVDRH	429
445	C REFERENCE OCTAGON)	WDTVDRH	430
	C	WDTVDRH	431
	DO 330 LL = 1, NAP	WDTVDRH	432
	RDFUS (LL) = (RDFUS (LL) / RHOREF) **2 * 100.	WDTVDRH	433
	330 CONTINUE	WDTVDRH	434
450	IF (NFUS .GT. 1) GO TO 331	GLM	21
	WRITE (13, 620) (ZC12 (JJ), JJ = 1, NAP)	WDTVDRH	435
	WRITE (6, 630) (ZC12 (JJ), JJ = 1, NAP)	GLM	22
	WRITE (13, 620) (RDFUS (LL), LL = 1, NAP)	WDTVDRH	437
	WRITE (6, 630) (RDFUS (LL), LL = 1, NAP)	WDTVDRH	438
455	IF (NFUS .EQ. 1) GO TO 330	GLM	23
	331 CONTINUE	GLM	24
	C	GLM	25
	C FOR CIRCULAR FUSELAGES WITH MORE THAN 1 SEGMENT	GLM	26
	C	GLM	27
460	DO 335 NSIG=1, NFUS	GLM	28
	C	GLM	29
	C CARDS 7 + 8 OF OCTAGONAL FUSFLAGE	GLM	30

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	C		GLH	31
		XFUSS1=XFUS(1,NSEG)	GLH	32
465		CORDF1=XFUS(NFORX(NSEG),NSEG)-XFUS(1,NSEG)	GLH	33
		WRITE(13,770) XFUSS1,YFUSS1,ZFUSS1,CORDF1,NSEG	GLH	34
		WRITE(6,780) XFUSS1,YFUSS1,ZFUSS1,CORDF1,NSEG	GLH	35
		WRITE(13,770) XFUSS1,YFUSS1,ZFUSS2,CORDF1,NSEG	GLH	36
470		WRITE(6,780) XFUSS1,YFUSS1,ZFUSS2,CORDF1,NSEG	GLH	37
	C		GLH	38
	C	CARD 9 (SUB PANEL CONTROLS OF OCTAGONAL FUSELAGE)	GLH	39
	C		GLH	40
		RNCV=NFORX(NSEG)-1.	GLH	41
475		WRITE(13,580) INVOP,RNCV,SPC,CURV	GLH	42
		WRITE(6,590) INVOP,RNCV,SPC,CURV	GLH	43
	C		GLH	44
	C	POLAR COORDINATES FOR REFERENCE OCTAGON	GLH	45
	C		GLH	46
480		WRITE(13,620)((PHI(JK),RHOREF),JK=1,5)	GLH	47
		WRITE(6,630)((PHI(JK),RHOREF),JK=1,5)	GLH	48
	C		GLH	49
	C	CARD 11 (ADDITIONAL CONTROL PARAMETERS)	GLH	50
	C		GLH	51
485		NAP=NFORX(NSEG)	GLH	52
		WRITE(13,600) AINC1,AINC2,ITS,NAP,IQUANT,ISYNT,NPP	GLH	53
		WRITE(6,610) AINC1,AINC2,ITS,NAP,IQUANT,ISYNT,NPP	GLH	54
		IF(NAP.LE.2) GO TO 335	GLH	55
	C		GLH	56
490	C	CARD 14 (PERCENT LENGTH OF SEGMENT)	GLH	57
	C		GLH	58
		XFUSN=XFUS(NAP,NSEG)	GLH	59
		PI=3.14159265	GLH	60
		JJ=1	GLH	61
		DO 333 LUP=1,NAP	GLH	62
495		XFPCT(JJ)=(XFUS(LUP,NSEG)-XFUS(1,NSEG))/(XFUSN-XFUS(1,NSEG))*100.	GLH	63
		ZC12(JJ)=ZFUS(LUP,NSEG)/(XFUSN-XFUS(1,NSEG))*100.	GLH	64
		FUSRAD(LUP,NSEG)=SQRT(FUSARD(LUP,NSEG)/PI)	GLH	65
		RUFUS(JJ)=FUSRAD(LUP,NSEG)	GLH	66
		JJ=JJ+1	GLH	67
500	333	CONTINUE	GLH	68
		WRITE(13,620) (XFPCT(J),J=1,NAP)	GLH	69
		WRITE(6,630) (XFPCT(J),J=1,NAP)	GLH	70
	C		GLH	71
	C	CARD 16 (AREA RATIOS WRT REFERENCE OCTAGON)	GLH	72

505	C	DO 334 LL=1,NAP	GLH	73
		RLFUS(LL)=(RCFUS(LL)/PHUREFF)**2*100.	GLH	74
	334	CONTINUE	GLH	75
		WRITE (L3,620) (ZC12(JJ),JJ=1,NAP)	GLH	76
510		WRITE (6,630) (ZC12(JJ),JJ=1,NAP)	GLH	77
		WRITE (L3,620) (RUFUS(LL),LL=1,NAP)	GLH	78
		WRITE (6,630) (RUFUS(LL),LL=1,NAP)	GLH	79
	335	CONTINUE	GLH	80
		GO TO 380	GLH	81
515	C		GLH	82
	C	SFT UP FOR CARDS 14, 16, 16 OF ZERO THICKNESS FUSELAGE TREATMENT	WDTVORN	440
	C		WDTVORN	441
	C		WDTVORN	442
	340	JJ = 1	WDTVORN	443
		DO 350 KI = 1, NFUS	WDTVORN	444
520		KISS = NFUSX (KI) -1	WDTVORN	445
		IF (KI .EQ. NFUS) KISS = NFUSX (NFUS)	WDTVORN	446
		DO 350 LN = 1, KISS	WDTVORN	447
		XFPCT (JJ) = XFUS (LN, KI) / (XFUSN - XFUS1) *100.	WDTVORN	448
		ZC12(JJ)=(ZFUS(LN,KI)-(ZFUS(1,1)-WAFORG(1,3)))/(XFUSN-XFUS1)*100.	WDTVORN	449
525		JJ = JJ + 1	WDTVORN	450
	350	CONTINUE	WDTVORN	451
		GL TO 140	WDTVORN	452
	360	WRITE (L3, 620) (XFPCT (J), J = 1, NAP)	WDTVORN	453
		WRITE (6, 630) (XFPCT (J), J = 1, NAP)	WDTVORN	454
530		DO 370 I = 1, 2	WDTVORN	455
		WRITE (L3, 620) (ZC12 (J), J = 1, NAP)	WDTVORN	456
		WRITE (6, 630) (ZC12 (J), J = 1, NAP)	WDTVORN	457
	370	CONTINUE	WDTVORN	458
	C		WDTVORN	459
535	C	NACILLE TREATMENT	WDTVORN	460
	C	SETTING UP FOR CARD 7 ^ 6	WDTVORN	461
	C		WDTVORN	462
	380	IF (J3 .EQ. 0) GO TO 450	WDTVORN	463
		DO 440 JJ = 1, NP	WDTVORN	464
540		X1 = FODORG (JJ, 1)	WDTVORN	465
		Y1 = PODORG (JJ, 2)	WDTVORN	466
		Z1 = PODORG (JJ, 3) + PODORD (JJ, 1)	WDTVORN	467
		CURD1 = XPOD (JJ, NPOCOR) - XPUD (JJ, 1)	WDTVORN	468
		DO 390 KK = 1, 2	WDTVORN	469
545		WRITE (L3, 740) X1, Y1, Z1, CURD1, JJ	WDTVORN	470
		WRITE (6, 750) X1, Y1, Z1, CURD1, JJ	WDTVORN	471

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390 CONTINUE
C
C SETTING UP FOR NACELLE CARD 9
550 C
      TNVOR = R
      RNCV = NPORDR -1
      IF (RNCV .LT. 5) RNCV = 5
      SPC = 0.
      CURV = 499.
      WRITE (L3, 550) TNVOR, RNCV, SPC, CURV
      WRITE (6, 590) TNVOR, RNCV, SPC, CURV
C
C SET UP FOR NACELLE CARD 10 (POLAR COORDS. OF CURVED PANELS)
560 C
      DD 400 JK = 1, 9
      PHI (JK) = 90. - (JK -1) *45.
      RHC = PORDRD (JJ, 1)
400 CONTINUE
      WRITE (L3, 620) ((PHI (JK), RHO), JK = 1, 9)
      WRITE (6, 630) ((PHI (JK), RHO), JK = 1, 9)
C
C SET UP FOR CARD 11 (ADDITIONAL CONTROL PARAMETERS)
570 C
      AINC1 = 0.
      AINC2 = 0.
      ITS = 0
      NAP = NPORDR
      IQANT = 0
      ISYNT = 0
      NFP = 1
      WRITE (L3, 600) AINC1, AINC2, ITS, NAP, IQANT, ISYNT, NFP
      WRITE (6, 610) AINC1, AINC2, ITS, NAP, IQANT, ISYNT, NFP
C
C SET UP FOR NACELLE CARD 14 (PERCENT LENGTH STATIONS)
580 C
      DD 410 LL = 1, NAP
      XAF (LL) = ((XPDD (JJ, LL) - XPDD (JJ, 1)) / (XPDD (JJ, NAP)
      * - XPDD (JJ, 1))) *2 +100.
585 410 CONTINUE
      WRITE (L3, 620) (XAF (J), J = 1, NAP)
      WRITE (6, 630) (XAF (J), J = 1, NAP)
C

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590	C	SETTING UP FOR NACELLE CARD 16 ^ 18 (PERCENT OF REFERENCE OCTAGON)	WDTVORN	514
	C	DO 420 LL = 1, NAP	WDTVORN	515
		ZCP12 (JJ, LL) = PDDORD (JJ, LL) / PDDORD (JJ, 1) * 100.	WDTVORN	516
	420	CONTINUE	WDTVORN	517
		ZERO = 0.	WDTVORN	518
595		WRITE (L3, 620) (ZERO)	WDTVORN	519
		WRITE (6, 620) (ZERO)	WDTVORN	520
		WRITE (L3, 620) (ZCP12 (JJ, LL), LL = 1, NAP)	WDTVORN	521
		WRITE (6, 630) (ZCP12 (JJ, LL), LL = 1, NAP)	WDTVORN	522
	440	CONTINUE	WDTVORN	523
600	C		WDTVORN	524
	C	FINS TREATMENT	WDTVORN	525
	C		WDTVORN	526
	C	SET FOR CARDS 7 ^ 6 (BOTH SIDES OF MAJOR PANEL)	WDTVORN	527
	C		WDTVORN	528
605	450	IF (J4 .EQ. 0) GO TO 470	WDTVORN	529
		DO 460 NN = 1, NF	WDTVORN	530
		WRITE (L3, 660) ((FINDRG (NN, 1, J), J = 1, 4), NN, I = 1, 2)	WDTVORN	531
		WRITE (6, 670) ((FINDRG (NN, I, J), J = 1, 4), NN, I = 1, 2)	WDTVORN	532
	C		WDTVORN	533
610	C	SETTING UP FOR CARD 9 (SUB PANEL CONTROLS)	WDTVORN	534
	C		WDTVORN	535
		INVOR = 2.0	WDTVORN	536
		RNCV = 10.	WDTVORN	537
		SPC = 1.	WDTVORN	538
615		CUPV = 0.	WDTVORN	539
		WRITE (L3, 580) INVOR, RNCV, SPC, CUPV	WDTVORN	540
		WRITE (6, 590) INVOR, RNCV, SPC, CUPV	WDTVORN	541
	C		WDTVORN	542
	C	SETTING UP FOR CARD 11 (ADDITIONAL CONTROL PANEL FOR FINS)	WDTVORN	543
620	C		WDTVORN	544
		AINC1 = 0.	WDTVORN	545
		AINC2 = 0.	WDTVORN	546
		ITS = 0	WDTVORN	547
		NAP = 0	WDTVORN	548
625		IQUANT = 0	WDTVORN	549
		ISYNT = 0	WDTVORN	550
		NPP = 0	WDTVORN	551
		WRITE (L3, 600) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP	WDTVORN	552
		WRITE (6, 610) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP	WDTVORN	553
630	460	CONTINUE	WDTVORN	554
			WDTVORN	555

PROGRAM WDTVORH 74/74 OPT=1

. FIN 4.6+452

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	470 IF (J4 .EQ. 0) GO TO 490	WDTVORN 556
	C	WDTVORN 557
	C SETUP FOR CANARDS	WDTVORN 558
	C	WDTVORN 559
635	C SET LF FLP CARDS 7 ^ 3 (BOTH SIDES OF MAJOR PANELS)	WDTVORN 560
	C	WDTVORN 561
	DO 480 KH = 1, NCAN	WDTVORN 562
	WRITE (L3, 680) ((CANORG (NH, I, J), J = 1, 4), NH, I = 1, 2)	WDTVORN 563
	WRITE (6, 690) ((CANORG (NH, I, J), J = 1, 4), NH, I = 1, 2)	WDTVORN 564
640	C	WDTVORN 565
	C SETTING UP FOR CARD 9 (SUB PANEL CONTROLS)	WDTVORN 566
	C	WDTVORN 567
	INVR = 2.0	WDTVORN 568
	RICV = 10.	WDTVORN 569
645	SPC = 1.	WDTVORN 570
	CLAV = 0.	WDTVORN 571
	WRITE (L3, 580) INVR, RNCV, SPC, CURV	WDTVORN 572
	WRITE (6, 590) INVR, RNCV, SPC, CURV	WDTVORN 573
	C	WDTVORN 574
650	C SETTING UP FOR CARD 11 (ADDITIONAL CONTROL PANELS FOR CANARDS)	WDTVORN 575
	C	WDTVORN 576
	AINC1 = 0.	WDTVORN 577
	AINC2 = 0.	WDTVORN 578
	ITS = 0	WDTVORN 579
655	NAP = 0	WDTVORN 580
	ICLANT = 0	WDTVORN 581
	ISYNT = 0	WDTVORN 582
	WRITE (L3, 600) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP	WDTVORN 583
	WRITE (6, 610) AINC1, AINC2, ITS, NAP, IQUANT, ISYNT, NPP	WDTVORN 584
660	480 CONTINUE	WDTVORN 585
	490 NX5 = 0	WDTVORN 586
	NYS = 0	WDTVORN 587
	NZ5 = 0	WDTVORN 588
	WRITE (L3, 700) NX5, NYS, NZ5	WDTVORN 589
665	WRITE (6, 710) NX5, NYS, NZ5	WDTVORN 590
	500 FORMAT (3 (I2, 8X), 4F10.4, I2, 5X, I3)	WDTVORN 591
	510 FORMAT (1H, 3 (I2, 8X), 4F10.4, I2, 5X, I3)	WDTVORN 592
	520 FORMAT (I2, 8X, 7F10.3)	WDTVORN 593
	530 FORMAT (1H, I2, 8X, 7F10.3)	WDTVORN 594
670	540 FORMAT (I2, 8X, F10.2, 4F10.4)	WDTVORN 595
	550 FORMAT (1H, I2, 8X, F10.2, 4F10.4)	WDTVORN 596
	560 FORMAT (4F10.4, 10X, "WING PANEL NO.", I2)	WDTVORN 597

PROGRAM WDTVORN

74/74

GPT=1

FTN 4,6+452

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	570	FORMAT (1H , 4F10.4, 10X, 14HWIN PANEL NO., I2)	WDTVORN	598
	580	FORMAT (4F10.4, 10X, 17HNVCF,RNCV,SPC,PDL)	WDTVORN	599
675	590	FORMAT (1H , 4F10.4, 10X, 17HNVDR,RNCV,SPC,PDL)	WDTVORN	600
	600	FORMAT (2F10.4, 5 (12, 8X))	WDTVORN	601
	610	FORMAT (1H , 2F10.4, 5 (12, 8X))	WDTVORN	602
	620	FORMAT (8F10.4)	WDTVORN	603
	630	FORMAT (1H , 8F10.4)	WDTVORN	604
680	640	FORMAT (8F10.4)	WDTVORN	605
	650	FORMAT (1H , 8F10.4)	WDTVORN	606
	660	FORMAT (4F10.4, 10X, 13HFIN PANEL NO., I2)	WDTVORN	607
	670	FORMAT (1H , 4F10.4, 10X, 13HFIN PANEL NO., I2)	WDTVORN	608
	680	FORMAT (4F10.4, 10X, 16HCANARD PANEL NO., I2)	WDTVORN	609
6F5	690	FORMAT (1H , 4F10.4, 10X, 16HCANARD PANEL NO., I2)	WDTVORN	610
	700	FORMAT (3 (12, 8X) , 10X, 11HNXS,NYS,NZS)	WDTVORN	611
	710	FORMAT (1X, 3 (12, 8X) , 10X, 11HNXS,NYS,NZS)	WDTVORN	612
	720	FORMAT (4F10.4, 10X, 14HFUSELAGE PANEL)	WDTVORN	613
	730	FORMAT (1H , 4F10.4, 10X, 14HFUSELAGE PANEL)	WDTVORN	614
690	740	FORMAT (4F10.4, 10X, 16HNACELLE PANEL NO, I2)	WDTVORN	615
	750	FORMAT (1H , 4F10.4, 10X, 16HNACELLE PANEL NO, I2)	WDTVORN	616
	760	STOP	WDTVORN	617
	770	FORMAT (4F10.4, 10X, 18HFUSELAGE PANEL NO., I2)	GLH	83
	780	FORMAT (1H , 4F10.4, 10X, 18HFUSELAGE PANEL NO., I2)	GLH	84
695	END		WDTVORN	618

SUBROUTINE START

74/74 OPT=1

FTN 4.6+452

78/04/20. 13.52.55

1		SUBROUTINE START	WDTVORN	619
	C		WDTVORN	620
	C	INPUTS AND INITIALIZES CONFIGURATION DESCRIPTION	WDTVORN	621
	C	REFERENCE NASA TN X-2074, SEPT 1970	WDTVORN	622
5	C		WDTVORN	623
		COMMON ABC (20), JO, J1, J2, J3, J4, J5, J6, NNAF, NNAFOR, NFUS,	WDTVORN	624
		* NRADX (4), NFORX (4), NP, NPODOR, NF, NFINOR, NCAN, NCANDR,	WDTVORN	625
		* J2TEST, LERR, NRICH, REFA, NCASE, XMACH, NX, NTHETA, NREST,	WDTVORN	626
		* XREST (10), SKL	WDTVORN	627
10		COMMON/BLK2/V,XFUS1,XFUSN	WDTVORN	628
		COMMON/BLACK/XAF (30), WAFORG (20, 4), WAFORD (20, 3, 30),	WDTVORN	629
		* TZORD (20, 30), XFUS (30, 4), ZFUS (30, 4), SFUS (30, 30, 1),	WDTVORN	630
		* FUSARD (30, 4), FUSRAD (130, 4), PODORG (9, 3), XPOD (9, 30),	WDTVORN	631
		* PODORD (9, 30), NPTSPS (5), PDES (30, 30, 10), FINORG (6, 2, 4),	WDTVORN	632
15		* XFIN (6, 10), FINORD (6, 2, 10), CANORG (2, 2, 4), XCAN (2, 10),	WDTVORN	633
		* CANORD (2, 2, 10), CANORI (2, 2, 10)	WDTVORN	634
	C		WDTVORN	635
		DIMENSION ABCD (20), FORAG (4), PARNO (5), PARBA (5)	WDTVORN	636
	C		WDTVORN	637
20		DATA PI/3.141592657	WDTVORN	638
	C		WDTVORN	639
	10	FORMAT (10F7.0)	WDTVORN	640
	C		WDTVORN	641
	C	REFERENCE AREA	WDTVORN	642
25	C		WDTVORN	643
		SKL=1.	GLH	84
		IF (JO .NE. 1) GO TO 140	WDTVORN	644
		READ (5, 10) REFA, SKL	WDTVORN	645
		IF (SKL .EQ. 0.) SKL = 1.	WDTVORN	646
30	C		WDTVORN	647
	C	WING	WDTVORN	648
	C		WDTVORN	649
		IF (J1 .NE. 2) GO TO 20	WDTVORN	650
		GO TO 140	GLH	85
35	20	V = 0.	WDTVORN	652
		IF (J1 .EQ. 0) GO TO 140	WDTVORN	653
		N = ABS (NNAFOR)	WDTVORN	654
		NREC = (N + 9) / 10	WDTVORN	655
		I1 = -9	WDTVORN	656
40		I2 = 0	WDTVORN	657
		DO 30 NN = 1, NREC	WDTVORN	658
		I1 = I1 + 10	WDTVORN	659

SUBROUTINE START

74/74 OPT=1

FTN 4.6+452

78/04/20. 13.52.55

		I2 = I2 + 10	WDTVORN	660
		READ (5, 10) (XAF (I), I = I1, I2)	WDTVORN	661
45	30	CONTINUE	WDTVORN	662
		DO 40 I = 1, NWAF	WDTVORN	663
		READ (5, 10) (WAFORG (I, J), J = 1, 4)	WDTVORN	664
		DO 40 J = 1, 4	WDTVORN	665
		WAFORG (I, J) = WAFORG (I, J) / SKL	WDTVORN	666
50	40	CONTINUE	WDTVORN	667
		IF (J1 .LT. 0) GO TO 70	WDTVORN	668
		DO 60 NN = 1, NWAF	WDTVORN	669
		I1 = -9	WDTVORN	670
		I2 = 0	WDTVORN	671
55		DO 50 N1 = 1, NREC	WDTVORN	672
		I1 = I1 + 10	WDTVORN	673
		I2 = I2 + 10	WDTVORN	674
		READ (5, 10) (TZORD (NN, I), I = I1, I2)	WDTVORN	675
		DO 50 I = I1, I2	WDTVORN	676
60		TZORD (NN, I) = TZORD (NN, I) / SKL	WDTVORN	677
	50	CONTINUE	WDTVORN	678
		IF (J1 .EQ. 1) WAFORG (NN, 3) = WAFORG (NN, 3) + TZORD (NN, 1)	GLH	86
		DO 55 I = 1, NWAFOR	GLH	87
		IF (J1 .EQ. 1) TZORD (NN, I) = TZORD (NN, I) - TZORD (NN, 1)	GLH	88
65	55	CONTINUE	GLH	89
	60	CONTINUE	WDTVORN	679
		GO TO 90	WDTVORN	680
	70	DO 80 I = 1, NWAF	WDTVORN	681
		DO 80 K = 1, N	WDTVORN	682
70	80	TZORD (I, K) = 0.	WDTVORN	683
	90	L = 1	WDTVORN	684
		IF (NWAFOR .LT. 0) L = 2	WDTVORN	685
		DO 110 NN = 1, NWAF	WDTVORN	686
		DO 110 K = 1, L	WDTVORN	687
75		I1 = -9	WDTVORN	688
		I2 = 0	WDTVORN	689
		DO 100 N1 = 1, NREC	WDTVORN	690
		I1 = I1 + 10	WDTVORN	691
		I2 = I2 + 10	WDTVORN	692
80		READ (5, 10) (WAFORD (NN, K, I), I = I1, I2)	WDTVORN	693
	100	CONTINUE	WDTVORN	694
	110	CONTINUE	WDTVORN	695
		IF (NWAFOR .LT. 0) GO TO 130	WDTVORN	696
		DO 120 NN = 1, NWAF	WDTVORN	697

SUBROUTINE START

74/74 OPT=1

FTN 4,6+452

78/04/20. 13.52.55

85	DO 120 K = 1, N	WDTVORN	698
120	WAFORD (NN, 2, K) = WAFORD (NN, 1, K)	WDTVORN	699
130	CONTINUE	WDTVORN	700
	NWAFOR = IABS (NWAFOR)	WDTVORN	701
	J1 = IABS (J1)	WDTVORN	702
90	C	WDTVORN	703
	C	WDTVORN	704
	C	WDTVORN	705
	FUSELAGE	WDTVORN	706
	140 IF (J2 .NE. 2) GO TO 150	WDTVORN	707
	GO TO 310	WDTVORN	708
95	150 IF (J2 .EQ. 0) GO TO 310	WDTVORN	709
	J2TEST = 3	WDTVORN	710
	IF (J2 .EQ. -1 .AND. J6 .EQ. -1) J2TEST = 1	WDTVORN	711
	IF (J2 .EQ. -1 .AND. J6 .EQ. 0) J2TEST = 2	WDTVORN	712
	IF (J6 .EQ. 1) J2TEST = 1	WDTVORN	713
100	J2 = 1	WDTVORN	714
	NSUM = 1	WDTVORN	715
	DO 160 NFU = 1, NFUS	WDTVORN	716
	160 NSUM = NSUM + NFORX (NFU) -1	WDTVORN	717
	IF (NSUM .LE. 101) GO TO 180	WDTVORN	718
105	WRITE (6, 170)	WDTVORN	719
	170 FORMAT (//	WDTVORN	720
	* 60H CONSECUTIVE FUSELAGE POINTS EXCEED ALLOWABLE STORAGE OF 101	WDTVORN	721
	* 1H1)	WDTVORN	722
	STOP	WDTVORN	723
110	180 CONTINUE	GLH	90
	DO 305 NFU=1,NFUS	WDTVORN	725
	N = NFORX (NFU)	WDTVORN	726
	NRAO = NRADX (NFU)	WDTVORN	727
	NREC = (N + 9) /10	WDTVORN	728
115	I1 = -9	WDTVORN	729
	I2 = 0	WDTVORN	730
	DO 190 N1 = 1, NREC	WDTVORN	731
	I1 = I1 + 10	WDTVORN	732
	I2 = I2 + 10	WDTVORN	733
120	READ (5, 10) (XFUS (I, NFU), I = I1, I2)	WDTVORN	734
	DO 190 I = I1, I2	WDTVORN	735
	XFUS (I, NFU) = XFUS (I, NFU) /SKL	WDTVORN	736
	190 CONTINUE	WDTVORN	737
	IF (NFU .NE. 1) GO TO 200	WDTVORN	738
125	XFUS1 = XFUS (1, 1)	WDTVORN	739
	XFUSN = XFUS (N, 1)	WDTVORN	739

SUBROUTINE START

74/74 OPT=1

FTN 4.6+452

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	200	XFUS1 = AMIN1 (XFUS1, XFUS 1, NFU)	WDTVORN	740
		XFUSN = AMAX1 (XFUSN, XFUS (N NFU))	WDTVORN	741
		IF (J2TEST .NE. 2) GO TO 220	WDTVORN	742
130		I1 = -9	WDTVORN	743
		I2 = 0	WDTVORN	744
		DO 210 NI = 1, NREC	WDTVORN	745
		I1 = I1 + 10	WDTVORN	746
		I2 = I2 + 10	WDTVORN	747
135		READ (5, 10) (ZFUS (I, NFU), I = I1, I2)	WDTVORN	748
		DO 210 I = I1, I2	WDTVORN	749
		ZFUS (I, NFU) = ZFUS (I, NFU) /SKL	WDTVORN	750
	210	CONTINUE	WDTVORN	751
		GO TO 240	WDTVORN	752
140	220	DO 230 I = 1, N	WDTVORN	753
	230	ZFUS (I, NFU) = 0.	WDTVORN	754
	240	IF (J2TEST .NE. 3) GO TO 280	WDTVORN	755
		NCARD = (NRAD + 9) /10	WDTVORN	756
		DO 270 LN = 1, N	WDTVORN	757
145		DO 260 K = 1, 2	WDTVORN	758
		KK = K + (NFU - 1) *2	WDTVORN	759
		II = 10	WDTVORN	760
		I1 = -9	WDTVORN	761
		I2 = 0	WDTVORN	762
150		DO 250 NN = 1, NCARD	WDTVORN	763
		IF (NN .EQ. NCARD) II = MOD (NRAD, 10)	WDTVORN	764
		IF (II .EQ. 0) II = 10	WDTVORN	765
		I1 = I1 + 10	WDTVORN	766
		I2 = I2 + II	WDTVORN	767
155		READ (5, 10) (SFUS (I, LN, KK), I = I1, I2)	WDTVORN	768
		DO 250 I = I1, I2	WDTVORN	769
		SFUS (I, LN, KK) = SFUS (I, LN, KK) /SKL	WDTVORN	770
	250	CONTINUE	WDTVORN	771
	260	CONTINUE	WDTVORN	772
160	270	CONTINUE	WDTVORN	773
		GO TO 305	GLH	91
	280	I1 = -9	WDTVORN	775
		I2 = 0	WDTVORN	776
		DO 290 NI = 1, NREC	WDTVORN	777
		I1 = I1 + 10	WDTVORN	778
165		I2 = I2 + 10	WDTVORN	779
		READ (5, 10) (FUSARD (I, NFU), I = I1, I2)	WDTVORN	780
		DO 290 I = I1, I2	WDTVORN	781

SUBROUTINE START

74/74 OPT=1

FTN 4.6+452

78/04/20. 13.52.55

		FUSARD (I, NFU) = FUSARD (I, NFU) /SKL**2	WOTVORN	782
170	290	CONTINUE	WOTVORN	783
		DO 300 I = 1, N	WOTVORN	784
	300	FUSRAD (I, NFU) = SORT (FUSARD (I, NFU) /PI)	WOTVORN	785
	C		WOTVORN	786
	305	CONTINUE	GLH	92
175	C	NACELLES	WOTVORN	787
	C		WOTVORN	788
	310	IF (J3 .NE. 2) GO TO 320	WOTVORN	789
		GO TO 440	WOTVORN	790
	320	IF (J3 .EQ. 0) GO TO 440	WOTVORN	791
180		N = NPODOR	WOTVORN	792
		NREC = (N + 9) /10	WOTVORN	793
		DO 410 NN = 1, NP	WOTVORN	794
		READ (5, 10) (PODORG (NN, I), I = 1, 3)	WOTVORN	795
		DO 330 I = 1, 3	WOTVORN	796
195	330	PODORG (NN, I) = PODORG (NN, I) /SKL	WOTVORN	797
		I1 = -9	WOTVORN	798
		I2 = 0	WOTVORN	799
		DO 340 N1 = 1, NREC	WOTVORN	800
		I1 = I1 + 10	WOTVORN	801
190		I2 = I2 + 10	WOTVORN	802
		READ (5, 10) (XPOD (NN, I), I = I1, I2)	WOTVORN	803
		DO 340 I = I1, I2	WOTVORN	804
		XPOD (NN, I) = XPOD (NN, I) /SKL	WOTVORN	805
	340	CONTINUE	WOTVORN	806
195		IF (J3 .NE. -1) GO TO 390	WOTVORN	807
	C		WOTVORN	808
	C	ARBITRARILY DEFINED POD --READ NO. PTS FOR EACH STATION/POD	WOTVORN	809
	C		WOTVORN	810
		READ (5, 10) AN	WOTVORN	811
200		NPTSPS (NN) = AN	WOTVORN	812
		NPTS = NPTSPS (NN)	WOTVORN	813
		NCARD = (NPTSPS (NN) + 9) /10	WOTVORN	814
	C		WOTVORN	815
	C	NCARD = NO. CARDS AT EACH STATION (I) FOR EACH POD (NN)	WOTVORN	816
205	C		WOTVORN	817
		DO 380 LN = 1, NPODOR	WOTVORN	818
	C		WOTVORN	819
	C	LN STATION LOOP	WOTVORN	820
	C		WOTVORN	821
210		DO 370 K = 1, 2	WOTVORN	822

SUBROUTINE START

74/74 OPT=1

FTN 4.6+452

78/04/20. 13.52.55

	KK = K + (NN - 1) * 2	WDTVORN'	823
	EY = 2 * K - 3	WDTVORN	824
	II = 10	WDTVORN	825
	I1 = -9	WDTVORN	826
215	I2 = 0	WDTVORN	827
	DO 360 NA = 1, NCARD	WDTVORN	828
	IF (NA .EQ. NCARD) II = MOD (NPTSPS (NN), 10)	WDTVORN	829
	IF (II .EQ. 0) II = 10	WDTVORN	830
	I1 = I1 + 10	WDTVORN	831
220	I2 = I2 + II	WDTVORN	832
	READ (5, 10) (PDES (I, LN, K + (NN - 1) * 2), I = I1, I2)	WDTVORN	833
	DO 350 I = I1, I2	WDTVORN	834
	IF (PODORG (NN, 2) .EQ. 0.) GO TO 350	WDTVORN	835
	IF (I .EQ. NPTS) GO TO 350	WDTVORN	836
225	PDES (I, LN, K + (NN - 1) * 2 + I, LN, KK) = EY * PDES (I, LN, KK) / SKL +	WDTVORN	837
	* PODORG (NN, K + 1)	WDTVORN	838
350	PDES (I, LN, K + (NN - 1) * 2) = PDES (I, LN, K + (NN - 1) * 2)	WDTVORN	839
	* /SKL + PODORG (NN, K + 1)	WDTVORN	840
360	CONTINUE	WDTVORN	841
230	370 CONTINUE	WDTVORN	842
	380 CONTINUE	WDTVORN	843
	LPF = 1	WDTVORN	844
	IF (PODORG (NN, 2) .NE. 0.) NPTSPS (NN) = NPTSPS (NN) * 2 - 1	WDTVORN	845
	GO TO 410	WDTVORN	846
235	390 LPF = 0	WDTVORN	847
	I1 = -9	WDTVORN	848
	I2 = 0	WDTVORN	849
	DO 400 N1 = 1, NREC	WDTVORN	850
	I1 = I1 + 10	WDTVORN	851
240	I2 = I2 + 10	WDTVORN	852
	READ (5, 10) (PODORD (NN, I), I = I1, I2)	WDTVORN	853
	DO 400 I = I1, I2	WDTVORN	854
	PODORD (NN, I) = PODORD (NN, I) / SKL	WDTVORN	855
	400 CONTINUE	WDTVORN	856
245	410 CONTINUE	WDTVORN	857
	IF (LPF .EQ. 0) GO TO 440	WDTVORN	858
	DO 430 NN = 1, NP	WDTVORN	859
	C	WDTVORN	860
	C COMPUTE POD AREAS	WDTVORN	861
250	C	WDTVORN	862
	KK = 1 + (NN - 1) * 2	WDTVORN	863
	DO 420 I = 1, NPODOR	WDTVORN	864

SUBROUTINE START

74/74 OPT=1

FTN 4.6+452

78/04/20. 13.52.55

		PSI = 0.	WDTVORN	865
		NPTS = NPTSPS (NN)	WDTVORN	866
255		DO 420 K = 2, NPTS	WDTVORN	867
		ABAR = PDES (K - 1, I, KK) * PDES (K, I, KK + 1) - PDES (K, I, KK)	WDTVORN	868
		* * PDES (K - 1, I, KK + 1)	WDTVORN	869
		PSI = PSI + ABAR	WDTVORN	870
		IF (I .EQ. 1) PARNO (NN) = PSI	WDTVORN	871
260	420	CONTINUE	WDTVORN	872
	430	PARDA (NN) = PSI	WDTVORN	873
	C		WDTVORN	874
	C	FINS	WDTVORN	875
	C		WDTVORN	876
265	440	IF (J4 .NE. 2) GO TO 450	WDTVORN	877
		GO TO 480	WDTVORN	878
	450	IF (J4 .EQ. 0) GO TO 480	WDTVORN	879
		N = NFINOR	WDTVORN	880
		DO 470 NN = 1, NF	WDTVORN	881
270		READ (5, 10) ((FINORG (NN, I, J), J = 1, 4), I = 1, 2)	WDTVORN	882
		DO 460 I = 1, 2	WDTVORN	883
		DO 460 J = 1, 4	WDTVORN	884
	460	FINORG (NN, I, J) = FINORG (NN, I, J) / SKL	WDTVORN	885
		READ (5, 10) (XFIN (NN, I), I = 1, N)	WDTVORN	886
275		READ (5, 10) (FINORD (NN, 1, J), J = 1, N)	WDTVORN	887
	470	CONTINUE	WDTVORN	888
	C		WDTVORN	889
	C	CANARDS	WDTVORN	890
	C		WDTVORN	891
280	480	IF (J5 .NE. 2) GO TO 490	WDTVORN	892
		GO TO 540	WDTVORN	893
	490	IF (J5 .EQ. 0) GO TO 540	WDTVORN	894
		N = IABS (NCANOR)	WDTVORN	895
		DO 530 NN = 1, NCAN	WDTVORN	896
285		READ (5, 10) ((CANORG (NN, I, J), J = 1, 4), I = 1, 2)	WDTVORN	897
		DO 500 I = 1, 2	WDTVORN	898
		DO 500 J = 1, 4	WDTVORN	899
	500	CANORG (NN, I, J) = CANORG (NN, I, J) / SKL	WDTVORN	900
		READ (5, 10) (XCAN (NN, I), I = 1, N)	WDTVORN	901
290		READ (5, 10) (CANORD (NN, 1, J), J = 1, N)	WDTVORN	902
		IF (NCANOR .LT. 0) GO TO 520	WDTVORN	903
		DO 510 J = 1, N	WDTVORN	904
		DO 510 I = 1, 2	WDTVORN	905
		CANDR1 (NN, I, J) = CANORD (NN, I, J)	WDTVORN	906

SUBROUTINE START

74/74 OPT=1

FTN 4.6+452

78/04/20. 13.52.55

295

510 CONTINUE
GO TO 530

520 READ (5, 10) (CANOR1 (NN, 1, J), J = 1, N)
READ (5, 10) (CANOR1 (NN, 2, J), J = 1, N)

300

530 CONTINUE
NCANOR = IABS (NCANOR)
540 RETURN
END

WOTVORN 907
WOTVORN 908
WOTVORN 909
WOTVORN 910
WOTVORN 911
WOTVORN 912
WOTVORN 913
WOTVORN 914

SUBROUTINE LSTDT8 74/74 OPT=1

FTN 4.6+452

78/04/20. 13.52.55

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1      SUBROUTINE LSTDT8
      C
      DIMENSION A (20)
      WRITE (6, 40)
5      10 I = 0
      20 READ (5, 50) A
      IF (EOF (5) .NE. 0) GO TO 30
      WRITE (6, 80) A
      I = I + 1
10     IF (I .NE. 44) GO TO 20
      WRITE (6, 60)
      GO TO 10
      30 REWIND 5
      WRITE (6, 70)
15     RETURN
      40 FORMAT (1H1, 26HINPUT DATA LISTING FOLLOWS /1H )
      50 FORMAT (20A4)
      60 FORMAT (1H1)
      70 FORMAT (1H0, 17HINPUT DATA LISTED)
20     80 FORMAT (1H , 20A4)
      END

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WDTVORN 925
WDTVORN 926
WDTVORN 927
WDTVORN 928
WDTVORN 929
WDTVORN 930
WDTVORN 931
WDTVORN 932
WDTVORN 933
WDTVORN 934
WDTVORN 935
WDTVORN 936
WDTVORN 937
WDTVORN 938
WDTVORN 939
WDTVORN 940
WDTVORN 941
WDTVORN 942
WDTVORN 943
WDTVORN 944
WDTVORN 945

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SUBROUTINE TRANS

74/74 OPT=1

FTN 4.6+452

78/04/20. 13.52.55

```
1      SUBROUTINE TRANS
      DIMENSION CARD(8)
10     READ(99, 20) CARD
20     FORMAT(8A10)
5      IF(EOF(99)) .NE. 0) GO TO 30
      WRITE(5, 20) CARD
      GO TO 10
30     REWIND 5
      RETURN
10     END
```

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WDTVORN 915
WDTVORN 916
WDTVORN 917
WDTVORN 918
WDTVORN 919
WDTVORN 920
WDTVORN 921
WDTVORN 922
WDTVORN 923
WDTVORN 924
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APPENDIX D
SOURCE LISTING OF ORIGINAL PROGRAM VORTWD

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PROGRAM VORTWDN

74/74

OPT=1

FTN 4.6+452

78/04/18. 15.44.58

1	PROGRAM VORTWDN(INPUT,OUTPUT,TAPE99=INPUT,TAPE6=OUTPUT,TAPE5,	VORTWDN	1
	1 TAPE3)	VORTWDN	2
	CONTROL*VRLX,VORTWDN	9/29/76 VORTWDN	3
	C...	VORTWDN	4
5	C...PROGRAM TO CONVERT DATA FROM VORLAX PROGRAM OUTPUT INTO	VORTWDN	5
	C...WAVEDPAG INPUT. THERE ARE MANY RESTRICTIONS IN THIS CONVERSION	VORTWDN	6
	C...AND THE USERS GUIDE SHOULD BE CONSULTED FOR AN EXPLANATION.	VORTWDN	7
	C...	VORTWDN	8
	DIMENSION NWING (20), I1 (24), NAPX (40), XYZC2 (4, 40),	VORTWDN	9
10	* ZC12 (2, 30, 40), XAFX (30, 40), NFUSE (6), YFUS (6, 30),	VORTWDN	10
	* ZFUS (6, 30), XFUS (30), ABCD (6, 2, 4), NFPAN (6), XFIN (10),	VORTWDN	11
	* FINORD(10), XCAN(10), CANDRD(10), NCANP(2), NPPAN(9), RHO(20),	VORTWDN	12
	* PDDRG (3), PHEE (20), XPOD (9,10), PODRD (9,10), NPP(20)	VORTWDN	13
	DIMENSION XAF (50), ZC1 (50), ZC2 (50), AFUS(30), ZFUSS(30)	VORTWDN	14
15	DIMENSION DESCRP (10), ALPHA (4), PHI (51), RO (51), CURV (40),	VORTWDN	15
	* TITLE (20), XS (20), C1 (20), C2 (20)	VORTWDN	16
	REAL MACH, NVLR, LESWP	VORTWDN	17
	COMMON /SET4 /AINC1 (20), AINC2 (20)	VORTWDN	18
	COMMON /SET5 /XAPEX (40), YAPEX (40), ZAPEX (40), PDL (40),	VORTWDN	19
20	* LESWP (40), SYNTH (40), IQUANT (40)	VORTWDN	20
	COMMON /SET7 /RNCV (20), ITS (20)	VORTWDN	21
	COMMON /SET12 /CSTART (40), TAPER (40), PSPAN (40), NVDR (40)	VORTWDN	22
	COMMON /SET13 /MACH (8)	VORTWDN	23
	COMMON /SET23 /SLE1 (20), SLE2 (20), SPC (40)	VORTWDN	24
25	NAKELIST/INPUT/NWNGP, NWING, NFUSP, NFUSE, NF, NFPAN, NCAN, NCANP	VORTWDN	25
	*, PLOTSZ, NP, NPPAN	VORTWDN	26
10	FORMAT (20A4)	VORTWDN	27
20	FORMAT (1H1, 20A4)	VORTWDN	28
	CALL TRANS	VORTWDN	29
30	CALL LSTDTF	VORTWDN	30
	PI = 3.14159	VORTWDN	31
	L3 = 3	VORTWDN	32
	DO 40 I = 1, 10	VORTWDN	33
	XFIN (I) = 0.	VORTWDN	34
35	FINORD (I) = 0.	VORTWDN	35
	XCAN (I) = 0.	VORTWDN	36
	CANDRD (I) = 0.	VORTWDN	37
	IF (I .LE. 6) XFUS (I) = 0.	VORTWDN	38
40	CONTINUE	VORTWDN	39
	DO 50 I = 1, 30	VORTWDN	40
	DO 50 J = 1, 6	VORTWDN	41
	XFUS (I) = 0.	VORTWDN	42

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PROGRAM VORTWON

74/74 OPT=1

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		AFUS (1) = 0.	VORTWON	43
		YFUS (J, 1) = 0.	VORTWON	44
45		ZFUS (J, 1) = 0.	VORTWON	45
	50	CONTINUE	VORTWON	46
		DO 60 I = 1, 6	VORTWON	47
		DO 60 J = 1, 2	VORTWON	48
		DO 60 K = 1, 4	VORTWON	49
50		ABCD (I, J, K) = 0.	VORTWON	50
	60	CONTINUE	VORTWON	51
		DO 70 I = 1, 2	VORTWON	52
		DO 70 J = 1, 30	VORTWON	53
		DO 70 K = 1, 40	VORTWON	54
55		ZC12 (I, J, K) = 0.	VORTWON	55
	70	CONTINUE	VORTWON	56
		NWNGP = 0	VORTWON	57
		NF = 0	VORTWON	58
		NCAN = 0	VORTWON	59
60		NFUSP = 0	VORTWON	60
		DTR = .017453	VORTWON	61
		PLOTSZ = 10.	VORTWON	62
		READ (5, INPUT)	VORTWON	63
		IF (EOF (5) .NE. 0) GO TO 940	VORTWON	64
65		READ (5, 10) TITLE	VORTWON	65
		WRITE (13, 10) TITLE	VORTWON	66
		READ (5, 80) ISOLV, LAX, LAY, REXPAR, HAG, FLOATX, FLOATY, ITRMAX	VORTWON	67
	80	FDPHAT (3 (12, 8X), 4F10.0, 7X, 13)	VORTWON	68
		READ (5, 90) NMACH, (MACH (1), I = 1, NMACH)	VORTWON	69
70	90	FORMAT (12, 8X, 7F10.0)	VORTWON	70
		WRITE (6, 20) TITLE	VORTWON	71
		READ (5, 90) NALPHA, (ALPHA (1), I = 1, NALPHA)	VORTWON	72
		READ (5, 90) LATRAL, PSI, PITCHQ, ROLLQ, YAWQ, VINQ	VORTWON	73
		IF (PSI .NE. 0.) LATRAL = 1	VORTWON	74
75		IF (ROLLQ .NE. 0.) LATRAL = 1	VORTWON	75
		IF (YAWQ .NE. 0.) LATRAL = 1	VORTWON	76
		IF (VINQ .LE. 0.001) VINQ = 1.0	VORTWON	77
		READ (5, 100) NPAN, SREF, CBAR, XBAR, ZBAR, WSPAN	VORTWON	78
	100	FORMAT (12, 8X, 5F10.0)	VORTWON	79
80		IF (WSPAN .LE. 0.0001) WSPAN = 2.0	VORTWON	80
	C		VORTWON	81
	110	FORMAT (8F10.0)	VORTWON	82
		INVERS = 0	VORTWON	83
		DO 200 I = 1, NPAN	VORTWON	84

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85	READ (5, 120) X1, Y1, Z1, CORD1, DESCRP	VORTWON	85
	READ (5, 120) X2, Y2, Z2, CORD2, DESCRP	VORTWON	86
	XYZC2 (1, 1) = X2	VORTWON	87
	XYZC2 (2, 1) = Y2	VORTWON	88
	XYZC2 (3, 1) = Z2	VORTWON	89
90	XYZC2 (4, 1) = CORD2	VORTWON	90
	READ (5, 120) NVOR (1), RNCV (1), SPC (1), CURV (1), DESCRP	VORTWON	91
	PDL (1) = 0.	VORTWON	92
	IF (CURV (1) .NE. 0.) PDL (1) = 999.	VORTWON	93
	IF (CURV (1) .GT. 500.0) CURV (1) = 0.0	VORTWON	94
95	120 FORMAT (4F10.0, 10A4)	VORTWON	95
	INTRAC = 1	VORTWON	96
	IF (PDL (1) .EQ. 0.) INTRAC = 0	VORTWON	97
	XAPEX (1) = X1	VORTWON	98
	YAPEX (1) = Y1	VORTWON	99
100	ZAPEX (1) = Z1	VORTWON	100
	CSTAPT (1) = CORD1	VORTWON	101
	DELTAY = Y2 - Y1	VORTWON	102
	DELTAZ = Z2 - Z1	VORTWON	103
	IF (INTRAC .EQ. 0) PDL (1) = 1./DTR *ATAN2 (DELTAZ, DELTAY)	VORTWON	104
105	IF (INTRAC .EQ. 0) GO TO 150	VORTWON	105
	NV = NVOR (1)	VORTWON	106
	IBOT = 1	VORTWON	107
	IF (1 .EQ. 1) GO TO 140	VORTWON	108
	ITOP = 1 - 1	VORTWON	109
110	DO 130 J = 1, ITOP	VORTWON	110
	INV = NVOR (J)	VORTWON	111
	IBOT = IBOT + INV	VORTWON	112
	130 CONTINUE	VORTWON	113
	140 ITOP = IBOT + NV - 1	VORTWON	114
115	JJTOP = NVOR (1) + 1	VORTWON	115
	READ (5, 110) (PHI (JJ), RO (JJ), JJ = 1, JJTOP)	VORTWON	116
	PHFE (1) = PHI (1)	VORTWON	117
	RHC (1) = RO (1)	VORTWON	118
	150 READ (5, 160) AINC1 (1), AINC2 (1), ITS (1), NAP, IQUANT(1),	VORTWON	119
120	* ISYNT, NPP (1)	VORTWON	120
	NAPX (1) = NAP	VORTWON	121
	160 FORMAT (2F10.0, 5 (I2, BX))	VORTWON	122
	SYNTH (1) = ISYNT	VORTWON	123
	MAX = RNCV (1)	VORTWON	124
125	IF (ISYNT .EQ. 0) GO TO 170	VORTWON	125
	READ (5, 110) (C1 (K), K = 1, MAX)	VORTWON	126

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	READ (5, 110) (C2 (K), K = 1, MAX)	VORTWON	127
	INVERS = 1	VORTWON	128
	SLE1 (1) = 0.	VORTWON	129
130	SLE2 (1) = 0.	VORTWON	130
	GO TO 200	VORTWON	131
170	IF (NAP .LT. 3) GO TO 200	VORTWON	132
	ILE = ITS (1) * (1 - INTRAC)	VORTWON	133
	RLE1 = 0.0	VORTWON	134
135	RLE2 = 0.0	VORTWON	135
	READ (5, 110) (XAF (JJ), JJ = 1, NAP)	VORTWON	136
	DO 180 JJ = 1, NAP	VORTWON	137
180	XAF (JJ, 1) = XAF (JJ)	VORTWON	138
	IF (ILE .NE. 0) READ (5, 110) RLE1	VORTWON	139
140	READ (5, 110) (ZC1 (JJ), JJ = 1, NAP)	VORTWON	140
	IF (ILE .NE. 0) READ (5, 110) RLE2	VORTWON	141
	READ (5, 110) (ZC2 (JJ), JJ = 1, NAP)	VORTWON	142
	DO 190 JJ = 1, NAP	VORTWON	143
	ZC12 (1, JJ, 1) = ZC1 (JJ)	VORTWON	144
145	ZC12 (2, JJ, 1) = ZC2 (JJ)	VORTWON	145
200	CONTINUE	VORTWON	146
	READ (5, 210) NX5, NYS, NZ5	VORTWON	147
210	FORMAT (3 (I2, 0X))	VORTWON	148
	IF (NX5 .GT. 0) READ (5, 110) (XS (I), I = 1, NX5)	VORTWON	149
150	IF (NX5 .GT. 0) READ (5, 110) YNOT, DELTAY, ZNOT, DELTAZ	VORTWON	150
	DO 220 I = 1, 24	VORTWON	151
	II (I) = 0	VORTWON	152
220	CONTINUE	VORTWON	153
	II (1) = 1	VORTWON	154
155	IF (NWNGP .GT. 0) II (2) = 1	VORTWON	155
	IF (NWNGP .GT. 0) NAP = NAPX (NWNG (1))	VORTWON	156
	IF (NFUSE .GT. 0) II (3) = 1	VORTWON	157
	IF (PDL (NFUSE (1)) .GT. 360.) II (3) = -1	VORTWON	158
	IF (NWNGP .GT. 0) II (6) = NWNGP + 1	VORTWON	159
160	II (10) = 1	VORTWON	160
	IF (NFUSE .EQ. 0) GO TO 230	VORTWON	161
	IB = NFUSE (1)	VORTWON	162
	IF (PDL (IB) .EQ. 0) II (11) = 3	VORTWON	163
	IF (PDL (IB) .GT. 360.) II (11) = NVDR (IB) + 1	VORTWON	164
165	ITNOSE = 0	VORTWON	165
	ITAPT = 0	VORTWON	166
	IF (ABS ((XYZC2 (1, IB) - XAPEX (IB))) .GE. .01) ITNOSE = 1	VORTWON	167
	IF (ABS ((XYZC2 (1, IB) + XYZC2 (4, IB)) - (XAPEX (IB) + CSTART (IB))) .GE. .01)	VORTWON	168

	* ITAFT = 1	VORTWON	169
170	230 IF (NWNGP .GT. 0) II (9) = NAP	VORTWON	170
	IF (NAPX(NWING(1)) .EQ. 0) II (9) = 2	VORTWON	171
	IF (II (9) .EQ. 2) NAP = 2	VORTWON	172
	IF (NFUSP .GT. 0 .AND. PDL(18) .LT. 360.) II(12) = 2+ITNOSE+ITAFT	VORTWON	173
	IF (PDL (18) .GT. 360.) II (12) = NAPX (18)	VORTWON	174
175	IF (NF .GT. 0) II (5) = 1	VORTWON	175
	II (21) = NF	VORTWON	176
	IF (NF .GT. 0) II (22) = 2	VORTWON	177
	IF (NCAN .GT. 0) II (6) = 1	VORTWON	178
	II (23) = NCAN	VORTWON	179
180	IF (NCAN .GT. 0) II (24) = 2	VORTWON	180
	IF (NP .GT. 0) II (4) = 1	VORTWON	181
	II (19) = NP	VORTWON	182
	NPODOR = NAPX (NPPAN (1))	VORTWON	183
	II (20) = NPODOR	VORTWON	184
185	WRITE (13, 480) II	VORTWON	185
	WRITE (6, 610) II	VORTWON	186
	ISREF = SREF	VORTWON	187
	WRITE (13, 490) ISREF	VORTWON	188
	WRITE (6, 620) ISREF	VORTWON	189
190	IF (NWNGP .EQ. 0) GO TO 290	VORTWON	190
	IF (II (9) .NE. 2) GO TO 240	VORTWON	191
	XAFX (1, NWING (1)) = 0.	VORTWON	192
	XAFX (2, NWING (1)) = 100.	VORTWON	193
195	240 WRITE (13, 500) (XAFX (JJ, NWING (1)), JJ = 1, NAP)	VORTWON	194
	WRITE (6, 630) (XAFX (JJ, NWING (1)), JJ = 1, NAP)	VORTWON	195
	DO 250 I = 1, NWNGP	VORTWON	196
	IW = NWING (I)	VORTWON	197
	WRITE (6, 640) XAPEX (IW), YAPEX (IW), ZAPEX (IW), CSTART (IW)	VORTWON	198
200	250 WRITE (13, 510) XAPEX (IW), YAPEX (IW), ZAPEX (IW), CSTART (IW)	VORTWON	199
	IWT = NWING (NWNGP)	VORTWON	200
	WRITE (13, 510) (XYZC2 (I, IWT), I = 1, 4)	VORTWON	201
	WRITE (6, 640) (XYZC2 (I, IWT), I = 1, 4)	VORTWON	202
	ZERO = 0.	VORTWON	203
	DO 270 I = 1, NWNGP	VORTWON	204
205	IW = NWING (I)	VORTWON	205
	DO 260 JJ = 1, NAP	VORTWON	206
	ZC12 (1, JJ, IW) = ZC12 (1, JJ, IW) *CSTART (IW) /100.	VORTWON	207
	ZC12 (2, JJ, IW) = ZC12 (2, JJ, IW) *XYZC2 (4, IW) /100.	VORTWON	208
210	260 CONTINUE	VORTWON	209
	WRITE (13, 520) (ZC12 (1, JJ, IW), JJ = 1, NAP)	VORTWON	210

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	WRITE (6, 650) (ZC12 (1, JJ, IW), JJ = 1, NAP)	VORTWON	211
270	CONTINUE	VORTWON	212
	WRITE (L3, 520) (ZC12 (2, JJ, IW), JJ = 1, NAP)	VORTWON	213
	WRITE (6, 650) (ZC12 (2, JJ, IW), JJ = 1, NAP)	VORTWON	214
215	NWNGP1 = NWNGP + 1	VORTWON	215
	DO 280 I = 1, NWNGP1	VORTWON	216
	WRITE (6, 660) (ZERO, JJ = 1, NAP)	VORTWON	217
	WRITE (L3, 530) (ZERO, JJ = 1, NAP)	VORTWON	218
280	CONTINUE	VORTWON	219
220	C	VORTWON	220
	C GETTING THE X VALUES FOR THE FUSELAGE	VORTWON	221
	C	VORTWON	222
290	NFORX = II (12)	VORTWON	223
	IF (NFUSP .EQ. 0) GO TO 370	VORTWON	224
225	IB = NFUSE (1)	VORTWON	225
	IF (PDL (IB) .GT. 360.) GO TO 330	VORTWON	226
	XFUS (1) = XAPEX (IB)	VORTWON	227
	IF (ITN0SE .GT. 0) XFUS (2) = XYZC2 (1, IB)	VORTWON	228
	XFLND = XYZC2 (1, IB) + XYZC2 (4, IB)	VORTWON	229
230	IF (ITN0SE .GT. 0 .AND. ITAFT .GT. 0) XFUS (3) = XFEND	VORTWON	230
	IF (ITN0SE .EQ. 0 .AND. ITAFT .GT. 0) XFUS (2) = XFEND	VORTWON	231
	XFUS (NFORX) = XAPEX (IB) + CSTART (IB)	VORTWON	232
	NWDS = NFORX	VORTWON	233
	IF (NFORX .LT. 6) NWDS = 6	VORTWON	234
235	WRITE (L3, 540) (XFUS (JJ), JJ = 1, NWDS)	VORTWON	235
	WRITE (6, 670) (XFUS (JJ), JJ = 1, NWDS)	VORTWON	236
	C	VORTWON	237
	C GETTING THE Y ^ Z VALUES FOR THE FUSELAGE	VORTWON	238
	C	VORTWON	239
240	YFUS (1, 1) = YAPEX (IB)	VORTWON	240
	YFUS (1, 2) = XYZC2 (2, IB)	VORTWON	241
	IF (ITN0SE .GT. 0) YFUS (1, 2) = YAPEX (IB)	VORTWON	242
	YFUS (1, 3) = YAPEX (IB)	VORTWON	243
	ZFUS (1, 1) = ZAPEX (IB)	VORTWON	244
245	ZFUS (1, 2) = XYZC2 (3, IB)	VORTWON	245
	IF (ITN0SE .GT. 0) ZFUS (1, 2) = ZAPEX (IB)	VORTWON	246
	ZFUS (1, 3) = ZAPEX (IB)	VORTWON	247
	IF (ITN0SE .EQ. 0) GO TO 300	VORTWON	248
	YFUS (2, 1) = YAPEX (IB)	VORTWON	249
250	YFUS (2, 2) = XYZC2 (2, IB)	VORTWON	250
	YFUS (2, 3) = YAPEX (IB)	VORTWON	251
	ZFUS (2, 1) = ZAPEX (IB)	VORTWON	252

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		ZFUS (2, 2) = XYZC2 (3, 1B)	VORTWON	253
		ZFUS (2, 3) = ZAPEX (1B)	VORTWON	254
255	300	IF (ITAFI .EQ. 0) GO TO 310	VORTWON	255
		YFUS (3, 1) = YAPEX (1B)	VORTWON	256
		YFUS (3, 2) = XYZC2 (2, 1B)	VORTWON	257
		YFUS (3, 3) = YAPEX (1B)	VORTWON	258
		ZFUS (3, 1) = ZAPEX (1B)	VORTWON	259
260		ZFUS (3, 2) = XYZC2 (3, 1B)	VORTWON	260
		ZFUS (3, 3) = ZAPEX (1B)	VORTWON	261
	310	CONTINUE	VORTWON	262
		YFUS (NFORX, 1) = YAPEX (1B)	VORTWON	263
		YFUS (NFORX, 2) = XYZC2 (2, 1B)	VORTWON	264
265		IF (ITAFI .GT. 0) YFUS (NFORX, 2) = YAPEX (1B)	VORTWON	265
		YFUS (NFORX, 3) = YAPEX (1B)	VORTWON	266
		ZFUS (NFORX, 1) = ZAPEX (1B)	VORTWON	267
		ZFUS (NFORX, 2) = XYZC2 (3, 1B)	VORTWON	268
		IF (ITAFI .GT. 0) ZFUS (NFORX, 2) = ZAPEX (1B)	VORTWON	269
270		ZFUS (NFORX, 3) = ZAPEX (1B)	VORTWON	270
		DO 320 I = 1, NFORX	VORTWON	271
		NRADX = II (11)	VORTWON	272
		NWDS = NRADX	VORTWON	273
		IF (NRADX .LT. 10) NWDS = 10	VORTWON	274
275		WRITE (L3, 560) (YFUS (I, JJ), JJ = 1, NWDS)	VORTWON	275
		WRITE (L6, 690) (YFUS (I, JJ), JJ = 1, NWDS)	VORTWON	276
		WRITE (L3, 570) (ZFUS (I, JJ), JJ = 1, NWDS)	VORTWON	277
		WRITE (L6, 700) (ZFUS (I, JJ), JJ = 1, NWDS)	VORTWON	278
	320	CONTINUE	VORTWON	279
280		GO TO 370	VORTWON	280
	C		VORTWON	281
	C	TREATMENT OF CURVED PANEL FUSELAGE	VORTWON	282
	C	GETTING X VALUES OF FUSELAGE	VORTWON	283
	C		VORTWON	284
285	330	NXFUS = II (12)	VORTWON	285
		DO 340 JJ = 1, NXFUS	VORTWON	286
		XFUS (JJ) = XAFX (JJ, 1B) * CSTART (1B) / 100.	VORTWON	287
	340	CONTINUE	VORTWON	288
		WRITE (L3, 550) (XFUS (JJ), JJ = 1, NXFUS)	VORTWON	289
290		WRITE (L6, 680) (XFUS (JJ), JJ = 1, NXFUS)	VORTWON	290
	C		VORTWON	291
	C	GETTING THE FUSELAGE CAMBER LINE	VORTWON	292
	C		VORTWON	293
		ZRATIO = 0.	VORTWON	294

PROGRAM VORTWON

74/74 UPT=1

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295	IF (NPP (IB) .GT. 0) ZRATIO = 1.0	VORTWON	295
	DO 350 JJ = 1, NXFUS	VORTWON	296
	ZFUSS (JJ) = ZC12 (1, JJ, IB) *ZRATIO *CSTART (IB) /100.	VORTWON	297
350	CONTINUE	VORTWON	298
	WRITE (L3, 900) (ZFUSS (JJ), JJ = 1, NXFUS)	VORTWON	299
300	WRITE (6, 910) (ZFUSS (JJ), JJ = 1, NXFUS)	VORTWON	300
	C	VORTWON	301
	C GETTING THE FUSELAGE CROSS-SECTIONAL AREAS, AFUS	VORTWON	302
	C EACH VORLAX CROSS SECTION IS ASSUMED HAVE A CONSTANT RADIUS	VORTWON	303
	C	VORTWON	304
305	DO 360 JJ = 1, NXFUS	VORTWON	305
	IF (NPP (IB) .GT. 0) ARATIO = ZC12 (2, JJ, IB) /100.	VORTWON	306
	IF (NPP (IB) .EQ. 0) ARATIO = 1.	VORTWON	307
	AFUS (JJ) = ARATIO *PI *RHO (IB) **2	VORTWON	308
360	CONTINUE	VORTWON	309
310	WRITE (L3, 920) (AFUS (JJ), JJ = 1, NXFUS)	VORTWON	310
	WRITE (6, 930) (AFUS (JJ), JJ = 1, NXFUS)	VORTWON	311
	C	VORTWON	312
	C SETTING UP FOR NACELLES	VORTWON	313
	C	VORTWON	314
315	370 IF (III (19) .EQ. 0) GO TO 410	VORTWON	315
	DO 400 JK = 1, NP	VORTWON	316
	NW = NPPAN (JK)	VORTWON	317
	PODDRG (1) = XAPEX (NW)	VORTWON	318
	PODDRG (2) = YAPEX (NW)	VORTWON	319
320	PODDRG (3) = ZAPEX (NW) - RHO (NW) *COS (DTR*PHEE (NW))	VORTWON	320
	WRITE (L3, 840) ((PODDRG (KL), KL = 1, 3), JK)	VORTWON	321
	WRITE (6, 850) ((PODDRG (KL), KL = 1, 3), JK)	VORTWON	322
	DO 380 KK = 1, 10	VORTWON	323
	XPOD (JK, KK) = 0.	VORTWON	324
325	IF (KK .GT. NPDDRG) GO TO 380	VORTWON	325
	XPOD (JK, KK) = XAFX (KK, NW) *CSTART (NW) /100.	VORTWON	326
380	CONTINUE	VORTWON	327
	WRITE (L3, 860) (XPOD (JK, KK), KK = 1, 10), JK	VORTWON	328
	WRITE (6, 870) (XPOD (JK, KK), KK = 1, 10), JK	VORTWON	329
330	DO 390 KK = 1, 10	VORTWON	330
	PODDRD (JK, KK) = 0.	VORTWON	331
	IF (KK .GT. NPDDRD) GO TO 390	VORTWON	332
	PODDRD (JK, KK) = ZC12 (2, KK, NW)	VORTWON	333
	IF (NPP (NW) .NE. 0) PODDRD (JK, KK) = SQRT (ZC12 (2, KK, NW) /100.) *RHO (NW)	VORTWON	334
335	390 CONTINUE	VORTWON	335
	WRITE (L3, 880) (PODDRD (JK, KK), KK = 1, 10), JK	VORTWON	336

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	WRITE (6, 690) (PODORD (JK, KK), KK = 1, 10), JK	VORTWON	337
	400 CONTINUE	VORTWON	338
	C	VORTWON	339
340	C SETTING UP FOR FINS	VORTWON	340
	C	VORTWON	341
	410 IF (NF .EQ. 0) GO TO 440	VORTWON	342
	DO 420 NN = 1, NF	VORTWON	343
	IB = NFAN (NN)	VORTWON	344
345	ABCD (NN, 1, 1) = XAPEX (IB)	VORTWON	345
	ABCD (NN, 1, 2) = YAPEX (IB)	VORTWON	346
	ABCD (NN, 1, 3) = ZAPEX (IB)	VORTWON	347
	ABCD (NN, 1, 4) = CSTART (IB)	VORTWON	348
	ABCD (NN, 2, 1) = XYZC2 (1, IB)	VORTWON	349
350	ABCD (NN, 2, 2) = XYZC2 (2, IB)	VORTWON	350
	ABCD (NN, 2, 3) = XYZC2 (3, IB)	VORTWON	351
	ABCD (NN, 2, 4) = XYZC2 (4, IB)	VORTWON	352
	420 CONTINUE	VORTWON	353
	XFIN (1) = 0.	VORTWON	354
355	XFIN (2) = 100.	VORTWON	355
	FINDRD (1) = 0.	VORTWON	356
	FINDRD (2) = 0.	VORTWON	357
	DO 430 NN = 1, NF	VORTWON	358
	WRITE (6, 710) ((ABCD (NN, 1, J), J = 1, 4), I = 1, 2)	VORTWON	359
360	WRITE (13, 580) ((ABCD (NN, 1, J), J = 1, 4), I = 1, 2)	VORTWON	360
	WRITE (13, 590) (XFIN (1), I = 1, 2)	VORTWON	361
	WRITE (6, 720) (XFIN (1), I = 1, 2)	VORTWON	362
	WRITE (13, 600) (FINDRD (1), I = 1, 2)	VORTWON	363
	WRITE (6, 730) (FINDRD (1), I = 1, 2)	VORTWON	364
365	430 CONTINUE	VORTWON	365
	C	VORTWON	366
	C SETTING UP FOR CANARDS	VORTWON	367
	C	VORTWON	368
	440 IF (NCAN .EQ. 0) GO TO 470	VORTWON	369
370	DO 450 NN = 1, NCAN	VORTWON	370
	IB = NCANP (NN)	VORTWON	371
	ABCD (NN, 1, 1) = XAPEX (IB)	VORTWON	372
	ABCD (NN, 1, 2) = YAPEX (IB)	VORTWON	373
	ABCD (NN, 1, 3) = ZAPEX (IB)	VORTWON	374
375	ABCD (NN, 1, 4) = CSTART (IB)	VORTWON	375
	ABCD (NN, 2, 1) = XYZC2 (1, IB)	VORTWON	376
	ABCD (NN, 2, 2) = XYZC2 (2, IB)	VORTWON	377
	ABCD (NN, 2, 3) = XYZC2 (3, IB)	VORTWON	378

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	ABCD (NN, 2, 4) = XYZC2 (4, 18)	VORTWON	379
380	450 CONTINUE	VORTWON	380
	XCAN (1) = 0.	VORTWON	381
	XCAN (2) = 100.	VORTWON	382
	CANORD (1) = 0.	VORTWON	383
	CANORD (2) = 0.	VORTWON	384
385	DO 460 NN = 1, NCAN	VORTWON	385
	WRITE (6, 750) ((ABCD (NN, I, J), J = 1, 4), I = 1, 2)	VORTWON	386
	WRITE (L3, 740) ((ABCD (NN, I, J), J = 1, 4), I = 1, 2)	VORTWON	387
	WRITE (L3, 760) (XCAN (I), I = 1, 2)	VORTWON	388
	WRITE (6, 770) (XCAN (I), I = 1, 2)	VORTWON	389
390	WRITE (L3, 780) (CANORD (I), I = 1, 2)	VORTWON	390
	WRITE (6, 790) (CANORD (I), I = 1, 2)	VORTWON	391
	460 CONTINUE	VORTWON	392
	470 WRITE (L3, 800) (PLOTSZ)	VORTWON	393
	WRITE (6, 810) (PLOTSZ)	VORTWON	394
395	PISOSZ = PLOTSZ * 1.2247	VORTWON	395
	WRITE (L3, 820) (PISOSZ)	VORTWON	396
	WRITE (6, 830) (PISOSZ)	VORTWON	397
	480 FORMAT (24I3)	VORTWON	398
	490 FORMAT (I7, 65X, 4HREFA)	VORTWON	399
400	500 FORMAT (10F7.2, 5H XAF)	VORTWON	400
	510 FORMAT (4F7.2, 42X, 6H WORG)	VORTWON	401
	520 FORMAT (10F7.2, 7H TZORD)	VORTWON	402
	530 FORMAT (10F7.3, 6H WORD)	VORTWON	403
	540 FORMAT (6F7.2, 28X, 6H XFUS)	VORTWON	404
405	550 FORMAT (10F7.2, 6H XFUS)	VORTWON	405
	560 FORMAT (10F7.2, 6H YFUS)	VORTWON	406
	570 FORMAT (10F7.2, 6H ZFUS)	VORTWON	407
	580 FORMAT (8F7.1, 14X, 8H FINORG)	VORTWON	408
	590 FORMAT (2F7.1, 56X, 6H XFIN)	VORTWON	409
410	600 FORMAT (2F7.1, 56X, 8H FINORD)	VORTWON	410
	610 FORMAT (1H, 24I3)	VORTWON	411
	620 FORMAT (1H, I7, 65X, 4HREFA)	VORTWON	412
	630 FORMAT (1H, 10F7.2, 5H XAF)	VORTWON	413
	640 FORMAT (1H, 4F7.2, 42X, 6H WORG)	VORTWON	414
415	650 FORMAT (1H, 10F7.2, 7H TZORD)	VORTWON	415
	660 FORMAT (1H, 10F7.3, 6H WORD)	VORTWON	416
	670 FORMAT (1H, 6F7.2, 28X, 6H XFUS)	VORTWON	417
	680 FORMAT (1H, 10F7.2, 6H XFUS)	VORTWON	418
	690 FORMAT (1H, 10F7.2, 6H YFUS)	VORTWON	419
420	700 FORMAT (1H, 10F7.2, 6H ZFUS)	VORTWON	420

PROGRAM VORTWON 74/74 OPT=1

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	710	FORMAT (1H , 8F7.1, 14X, 8H FINORG)	VORTWON	421
	720	FORMAT (1H , 2F7.1, 56X, 6H XFIN)	VORTWON	422
	730	FORMAT (1H , 2F7.1, 56X, 8H FINORD)	VORTWON	423
	740	FORMAT (8F7.1, 14X, 8H CANORG)	VORTWON	424
425	750	FORMAT (1H , 8F7.1, 14X, 8H CANORG)	VORTWON	425
	760	FORMAT (2F7.1, 56X, 6H XCAN)	VORTWON	426
	770	FORMAT (1H , 2F7.1, 56X, 6H XCAN)	VORTWON	427
	780	FORMAT (2F7.1, 56X, 8H CANORD)	VORTWON	428
	790	FORMAT (1H , 2F7.1, 56X, 8H CANORD)	VORTWON	429
430	800	FORMAT (3HX Y, 44X, F5.2, 3HURT)	VORTWON	430
	810	FORMAT (1H , 3HX Y, 44X, F5.2, 3HURT)	VORTWON	431
	820	FORMAT (3HX Z, 44X, F5.2, 7HORTISOL, 12X, 1H1)	VORTWON	432
	830	FORMAT (1H , 3HX Z, 44X, "26.62-24.139.23", 25X, F5.2, 3HURT, 16X, 1H1)	VORTWON	433
	840	FORMAT (3F7.2, 51X, 6HPDDORG, I2)	VORTWON	434
435	850	FORMAT (1H , 3F7.2, 51X, 6HPDDORG, I2)	VORTWON	435
	860	FORMAT (10F7.2, 2X, 6HXPOD , I2)	VORTWON	436
	870	FORMAT (1H , 10F7.2, 2X, 6HXPOD , I2)	VORTWON	437
	880	FORMAT (10F7.2, 2X, 6HPDDORD, I2)	VORTWON	438
	890	FORMAT (1H , 10F7.2, 2X, 6HPDDORD, I2)	VORTWON	439
440	900	FORMAT (10F7.2, 6H ZFUS)	VORTWON	440
	910	FORMAT (1H , 10F7.2, 6H ZFUS)	VORTWON	441
	920	FORMAT (10F7.1, 6H AFUS)	VORTWON	442
	930	FORMAT (1H , 10F7.1, 6H AFUJ)	VORTWON	443
		GO TO 30	VORTWON	444
445	940	STOP	VORTWON	445
		END	VORTWON	446

SUBROUTINE TRANS

74/74 OPT=1

FIN 4.6+452

78/04/18. 15.44.58

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1      SUBROUTINE TRANS
        DIMENSION CARD(8)
10     READ(99, 20) CARD
        20 FORMAT(8A10)
5      IF (EDF(99) .NE. 0) GO TO 30
        WRITE(5, 20) CARD
        GO TO 10
30     REWIND 5
        RETURN
10     END

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VORTWON 447
VORTWON 448
VORTWON 449
VORTWON 450
VORTWON 451
VORTWON 452
VORTWON 453
VORTWON 454
VORTWON 455
VORTWON 456

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APPENDIX E
LISTING OF MODIFICATIONS TO PROGRAM VORTWD

DECK STATUS AND MODIFICATIONS.
DECK - VORTWON

MODIFY - VER 1.2 78/04/21. 11.08.45.

VORTWON MODIFIERS.

GLM

D	1	TAPE31	VORTWON	2	
A	1	TAPE3,TAPE4)	GLM	1	2
A		C...THIS PROGRAM HAS BEEN MODIFIED BY G. L. MARTIN (KENTRON) TO	GLM	2	8
A		C...INCORPORATE MULTIELEMENT FUSELAGES AND PLOT THE MAJOR VORLAX PANELS	GLM	3	8
A		C...AUTOMATICALLY EACH TIME THE PROGRAM IS RUN. FOR INFORMATION	GLM	4	8
A		C...CONCERNING THIS PROGRAM AND ITS CURRENT STATUS CONTACT H. HEYSON	GLM	5	8
A		C...(NASA LANGLEY)	GLM	6	8
A		C...	GLM	7	8
D		* ZFUS (6, 30), XFUS (30), ABCD (6, 2, 4), NEPAN (6), XFIN (10),	VORTWON	11	
A		* ZFUS (6, 30), XFUS (4, 30), ABCD (6, 2, 4), NEPAN (6), XFIN (10),	GLM	8	11
D		* PODNRG (3), PHEE (20), XPDD (9,10), PODORD (9,10), NPP(20)	VORTWON	13	
A		* PODNRG (9,3), NPP (20), XPDD (9,10), PODORD (9,10)	GLM	9	13
D		DIMENSION YAF (50), ZC1 (50), ZC2 (50), AFUS(30), ZFUSS(30)	VORTWON	14	
A		DIMENSION YAF (50), ZC1 (50), ZC2 (50), AFUS (4, 30), ZFUSS (4,30)	GLM	10	14
D		DIMENSION DESCRP (10), ALPHA (8), PHI (51), RD (51), CURV (40),	VORTWON	15	
A		DIMENSION DESCRP (10), ALPHA (8), PHI (20, 6), RD (51), CURV (40),	GLM	11	15
A		DIMENSION YFUSD (4, 101, 6), ZFUSD (4, 101, 6), DEFG (6, 2, 4),	GLM	12	16
A		* XFUSD (4, 101), ZCSUB (3), XSUB (3), NXFUS (4)	GLM	13	16
D		IF (I .LE. 6) XFUS (I) = 0.	VORTWON	38	
A		DD 35 M = 1, 4	GLM	14	38
A	35	IF (I .LE. 6) XFUS (M, I) = 0.	GLM	15	38
D		XFUS (I) = 0.	VORTWON	42	
A		DD 45 M = 1, 4	GLM	16	42
A	45	XFUS (M, I) = 0.	GLM	17	42
A		DD 75 I = 1, 24	GLM	18	56
A		II (I) = 0	GLM	19	56
A	75	CONTINUE	GLM	20	56
D		IF (EOF (5) .NE. 0) GO TO 940	VORTWON	64	
D		READ (5, 10) TITLE	VORTWON	65	
A		IF (EOF (5)) 940, 76	GLM	21	65
A	76	READ (5, 10) TITLE	GLM	22	65
D		READ (5, 110) (PHI (JJ), RD (JJ), JJ = 1, JJTOP)	VORTWON	116	
A		READ (5, 110) (PHI (I, JJ), RD (JJ), JJ = 1, JJTOP)	GLM	23	116
D		PHEE (I) = PHI (I)	VORTWON	117	
D		II (10) = 1	VORTWON	160	
A		II (10) = NFUSP	GLM	24	160
A		IF (II (10) .GE. 2) II (13) = II (11)	GLM	25	173

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DECK STATUS AND MODIFICATIONS.
DECK - VORTWON

MODIFY - VER 1.2 78/04/21. 11.08.46.

A	IF (II (10) .GE. 3) II (15) = II (11)	GLM	26	173
A	IF (II (10) .GE. 4) II (17) = II (11)	GLM	27	173
A	DO 235 L = 1, 4	GLM	28	184
A	NXFUS (L) = NAPX (NFUSE (L))	GLM	29	184
A	235 CONTINUE	GLM	30	184
A	II (12) = NXFUS (1)	GLM	31	184
A	II (14) = NXFUS (2)	GLM	32	184
A	II (16) = NXFUS (3)	GLM	33	184
A	II (18) = NXFUS (4)	GLM	34	184
A	C	GLM	35	226
A	C FLAT FUSELAGE	GLM	36	226
A	C	GLM	37	226
D	XFUS (1) = XAPEX (IB)	VORTWON	227	
D	IF (ITNOSE .GT. 0) XFUS (2) = XYZC2 (1, IB)	VORTWON	228	
A	I = 1	GLM	38	228
A	IB = NFUSE (I)	GLM	39	228
A	XFUS (I, 1) = XAPEX (IB)	GLM	40	228
D	IF (ITNOSE .GT. 0 .AND. ITAFT .GT. 0) XFUS (3) = XFEND	VORTWON	230	
D	IF (ITNOSE .EQ. 0 .AND. ITAFT .GT. 0) XFUS (2) = XFEND	VORTWON	231	
D	XFUS (NFORX) = XAPEX (IB) + CSTART (IB)	VORTWON	232	
A	IF (ITNOSE .GT. 0 .AND. ITAFT .GT. 0) XFUS (I, 3) = XFEND	GLM	41	232
A	IF (ITNOSE .EQ. 0 .AND. ITAFT .GT. 0) XFUS (I, 2) = XFEND	GLM	42	232
A	XFUS (I, NFORX) = XAPEX (IB) + CSTART (IB)	GLM	43	232
D	WRITE (L3, 540) (XFUS (JJ), JJ = 1, NWDS)	VORTWON	235	
D	WRITE (6, 670) (XFUS (JJ), JJ = 1, NWDS)	VORTWON	236	
A	WRITE (L3, 540) (XFUS (I, JJ), JJ = 1, NWDS)	GLM	44	236
A	WRITE (6, 670) (XFUS (I, JJ), JJ = 1, NWDS)	GLM	45	236
D	330 NXFUS = II (12)	VORTWON	285	
A	330 DO 365 I = 1, NFUSP	GLM	46	285
A	IB = NFUSE (I)	GLM	47	285
D	DO 340 JJ = 1, NXFUS	VORTWON	286	
A	NR = NXFUS (I)	GLM	48	286
A	DO 340 JJ = 1, NR	GLM	49	286
D	XFUS (JJ) = XAFX (JJ, IB) * CSTART (IB) / 100.	VORTWON	287	
A	XFUS (I, JJ) = XAFX (JJ, IB) * CSTART (IB) / 100. + XAPEX (IB)	GLM	50	287
D	WRITE (L3, 550) (XFUS (JJ), JJ = 1, NXFUS)	VORTWON	289	
D	WRITE (6, 680) (XFUS (JJ), JJ = 1, NXFUS)	VORTWON	290	
A	IF (NAPX (IB) .GE. 3) GO TO 341	GLM	51	290
A	XFUS (I, 1) = XAPEX (IB)	GLM	52	290
A	XFUS (I, 2) = XAPEX (IB) + CSTART (IB)	GLM	53	290
A	341 CONTINUE	GLM	54	290

DECK STATUS AND MODIFICATIONS.
DECK - VORTWON

MODIFY - VER 1.2 78/04/21. 11.08.46.

A	WRITE (L3,550) (XFUS (I, JJ), JJ = 1, NB)	GLM	55	290
A	WRITE (6, 680) (XFUS (I, JJ), JJ = 1, NB)	GLM	56	290
D	DO 350 JJ = 1, NXFUS	VORTWON	296	
A	DO 350 JJ = 1, NB	GLM	57	296
D	ZFUSS (JJ) = ZC12 (I, JJ, IB) * ZRATIO * CSTART (IB) / 100.	VORTWON	297	
A	ZFUSS (I, JJ) = ZC12 (I, JJ, IB) * ZRATIO * CSTART (IB) / 100.	GLM	58	297
D	WRITE (L3, 900) (ZFUSS (JJ), JJ = 1, NXFUS)	VORTWON	299	
D	WRITE (6, 910) (ZFUSS (JJ), JJ = 1, NXFUS)	VORTWON	300	
A	WRITE (L3, 900) (ZFUSS (I, JJ), JJ = 1, NB)	GLM	59	300
A	WRITE (6, 910) (ZFUSS (I, JJ), JJ = 1, NB)	GLM	60	300
D	DO 360 JJ = 1, NXFUS	VORTWON	305	
A	DO 360 JJ = 1, NB	GLM	61	305
D	AFUS (JJ) = ARATIO * PI * RHO (IB) ** 2	VORTWON	308	
A	AFUS (I, JJ) = ARATIO * PI * RHO (IB) ** 2	GLM	62	308
A	IF (NAPX (IA) .GE. 7) GO TO 352	GLM	63	308
A	AFUS (I, 1) = PI * RHO (IB) ** 2	GLM	64	308
A	AFUS (I, 2) = AFUS (I, 1)	GLM	65	308
A	ARATIO = 1.0	GLM	66	308
A	352 CONTINUE	GLM	67	308
A	DO 351 JD=1,5	GLM	68	308
A	IO = I	GLM	69	308
A	XFUSD (IO, JJ) = XFUS (I, JJ)	GLM	70	308
A	NQ = NFUSE (I)	GLM	71	308
A	ZFWLE = ZAPEX (NQ) - RHO (NQ)	GLM	72	308
A	YFUSD (IO, JJ, JD) = SORT (ARATIO) * RHO (NQ) * COS (PHI (NQ, JD)	GLM	73	308
A	* + DTR)	GLM	74	308
A	ZFUSD (IO, JJ, JD) = SORT (ARATIO) * RHO (NQ) * SIN (PHI (NQ, JD)	GLM	75	308
A	* + DTR) + ZFWLE	GLM	76	308
A	351 CONTINUE	GLM	77	308
D	WRITE (L3, 920) (AFUS (JJ), JJ = 1, NXFUS)	VORTWON	310	
D	WRITE (6, 930) (AFUS (JJ), JJ = 1, NXFUS)	VORTWON	311	
A	WRITE (L3, 920) (AFUS (I, JJ), JJ = 1, NB)	GLM	78	311
A	WRITE (6, 930) (AFUS (I, JJ), JJ = 1, NB)	GLM	79	311
A	365 CONTINUE	GLM	80	311
D	PODORG (1) = XAPEX (NW)	VORTWON	318	
A	PODORG (JK, 1) = XAPEX (NW)	GLM	81	318
D	PODORG (2) = YAPEX (NW)	VORTWON	319	
A	PODORG (JK, 2) = YAPEX (NW)	GLM	82	319
D	PODORG (3) = ZAPEX (NW) - RHO (NW) * COS (DTR * PHEE (NW))	VORTWON	320	
A	PODORG (JK, 3) = ZAPEX (NW) - RHO (NW)	GLM	83	320
D	WRITE (L3, 840) ((PODORG (KL), KL = 1, 3), JK)	VORTWON	321	

DECK STATUS AND MODIFICATIONS.
DECK - VORTWON

MODIFY - VER 1.2 78/04/21, 11.08.47.

A	WRITE(L3, R40) ((PDDORG (JK, KL), KL = 1, 3), JK)	GLM	R4	321
D	WRITE (6, R50) ((PDDORG (KL), KL = 1, 3), JK)	VORTWON	322	
A	WRITE(6, R50) ((PDDORG (JK, KL), KL = 1, 3), JK)	GLM	85	322
A	DD 425 I = 1, 2	GLM	86	364
A	DD 425 J = 1, 4	GLM	87	364
A	DEFG(NN, I, J) = ARCD(NN, I, J)	GLM	88	364
A	425 CONTINUE	GLM	89	364
D	470 WRITE (L3, R00) (PLOTSZ)	VORTWON	393	
D	WRITE (6, R10) (PLOTSZ)	VORTWON	394	
D	PISOSZ = PLOTSZ * 1.2247	VORTWON	395	
D	WRITE (L3, R20) (PISOSZ)	VORTWON	396	
D	WRITE (6, R30) (PISOSZ)	VORTWON	397	
A	470 CONTINUE	GLM	90	397
A	C	GLM	91	397
A	C WRITE OUT AND PLOT THE VORLAX MAJOR PANEL GEOMETRY	GLM	92	397
A	C	GLM	93	397
A	L4=4	GLM	94	397
A	II (3) = 1	GLM	95	397
A	II (9) = 2	GLM	96	397
A	WRITE(L4,10)TITLF	GLM	97	397
A	WRITE(6,950)TITLF	GLM	98	397
A	WRITE(L4,480)II	GLM	99	397
A	WRITE(6, 610)II	GLM	100	397
A	WRITE(L4,490)ISPEF	GLM	101	397
A	WRITE(6, 620)ISREF	GLM	102	397
A	IF (II(8) .EQ. 0) GO TO 462	GLM	103	397
A	XSUB (1) = 0.0	GLM	104	397
A	XSUB (2) = 100.0	GLM	105	397
A	WRITE(L4,500) (XSUB (JJ), JJ = 1, 2)	GLM	106	397
A	WRITE(6, 630) (XSUB (JJ), JJ = 1, 2)	GLM	107	397
A	DD 451 I = 1, NWNGP	GLM	108	397
A	IW = NWING (I)	GLM	109	397
A	WRITE(L4,510) XAPEX (IW), YAPEX (IW), ZAPEX (IW), CSTART (IW)	GLM	110	397
A	WRITE(6, 640) XAPEX (IW), YAPEX (IW), ZAPEX (IW), CSTART (IW)	GLM	111	397
A	451 CONTINUE	GLM	112	397
A	IWT = NWING (NWNGP)	GLM	113	397
A	WRITE(L4,510) (XYZC2 (I, IWT), I = 1, 4)	GLM	114	397
A	WRITE(6, 640) (XYZC2 (I, IWT), I = 1, 4)	GLM	115	397
A	NWNGP1=NWNGP+1	GLM	116	397
A	DD 452 I = 1, NWNGP1	GLM	117	397
A	WRITE(L4,520) (ZFRD, JJ = 1, 2)	GLM	118	397

DECK STATUS AND MODIFICATIONS.
DECK - VORTWON

MODIFY - VFR 1.2

78/04/21. 11.08.51.

A		WRITE(6, 650) (ZERN, JJ = 1, 2)	GLM	119	397
A	452	CONTINUE	GLM	120	397
A		DO 453 I = 1, NWNGP1	GLM	121	397
A		WRITE(14, 530) (ZERN, JJ = 1, 2)	GLM	122	397
A		WRITE(6, 660) (ZERN, JJ = 1, 2)	GLM	123	397
A	453	CONTINUE	GLM	124	397
A	462	IF (II (10) .EQ. 0) GO TO 464	GLM	125	397
A		IPWQ = II(10)	GLM	126	397
A		DO 454 IO = 1, IPWQ	GLM	127	397
A		NFORX = NXFUS (IO)	GLM	128	397
A		WRITE(14, 550) (XFUSD (IO, JO), JO = 1, NFORX)	GLM	129	397
A		WRITE(6, 480) (XFUSD (IO, JO), JO = 1, NFORX)	GLM	130	397
A		DO 458 JO = 1, NFORX	GLM	131	397
A		WRITE(14, 560) (YFUSD (IO, JO, KO), KO = 1, 5)	GLM	132	397
A		WRITE(6, 690) (YFUSD (IO, JO, KO), KO = 1, 5)	GLM	133	397
A		WRITE(14, 570) (ZFUSD (IO, JO, KO), KO = 1, 5)	GLM	134	397
A		WRITE(6, 700) (ZFUSD (IO, JO, KO), KO = 1, 5)	GLM	135	397
A	458	CONTINUE	GLM	136	397
A	454	CONTINUE	GLM	137	397
A	464	IF (II (19) .EQ. 0) GO TO 466	GLM	138	397
A		DO 455 JK = 1, NP	GLM	139	397
A		WRITE(14, 840) (PDDORG (JK, KL), KL = 1, 3), JK	GLM	140	397
A		WRITE(6, 850) (PDDORG (JK, KL), KL = 1, 3), JK	GLM	141	397
A		WRITE(14, 860) (XPON (JK, KK), KK = 1, 10), JK	GLM	142	397
A		WRITE(6, 870) (XPON (JK, KK), KK = 1, 10), JK	GLM	143	77
A		WRITE(14, 880) (PDDORD (JK, KK), KK = 1, 10), JK	GLM	144	397
A		WRITE(6, 890) (PDDORD (JK, KK), KK = 1, 10), JK	GLM	145	397
A	455	CONTINUE	GLM	146	397
A	466	IF (II (21) .EQ. 0) GO TO 468	GLM	147	397
A		DO 456 NN = 1, NF	GLM	148	397
A		WRITE(14, 580) ((DEFG (NN, I, J), J = 1, 4), I = 1, 2)	GLM	149	397
A		WRITE(6, 710) ((DEFG (NN, I, J), J = 1, 4), I = 1, 2)	GLM	150	397
A		WRITE(14, 590) (XFIN (I), I = 1, 2)	GLM	151	397
A		WRITE(6, 720) (XFTN (I), I = 1, 2)	GLM	152	397
A		WRITE(14, 600) (FINORD (I), I = 1, 2)	GLM	153	397
A		WRITE(6, 730) (FINORD (I), I = 1, 2)	GLM	154	397
A	456	CONTINUE	GLM	155	397
A	468	IF (II (23) .EQ. 0) GO TO 472	GLM	156	397
A		DO 457 NN = 1, NCAN	GLM	157	397
A		WRITE(14, 740) ((ABCD (NN, I, J), J = 1, 4), I = 1, 2)	GLM	158	397
A		WRITE(6, 750) ((ABCD (NN, I, J), J = 1, 4), I = 1, 2)	GLM	159	397

DECK STATUS AND MODIFICATIONS.
DECK - VORTWON

MODIFY - VER 1.2

78/04/21. 11.08.51.

A	WRITE(14,760) (XCAN (I), I = 1, 2)	GLM	160	397
A	WRITE(6, 770) (XCAN (I), I = 1, 2)	GLM	161	397
A	WRITE(14,780) (CANORD (I), I = 1, 2)	GLM	162	397
A	WRITE(6, 790) (CANORD (I), I = 1, 2)	GLM	163	397
A	457 CONTINUE	GLM	164	397
A	472 CONTINUE	GLM	165	397
C	800 FORMAT (34X Y, 44X, F5.2, 3H0RT)	VORTWON	430	
D	810 FORMAT (1H , 34X Y, 44X, F5.2, 3H0RT)	VORTWON	431	
C	820 FORMAT (34X Z, 44X, F5.2, 7H0RTISO1, 12X, 1H1)	VORTWON	432	
D	830 FORMAT (1H , 34X Z, 4X, "26.62-24.139.23", 25X, F5.2, 3H0RT, 16X, 141)	VORTWON	433	
A	890 FORMAT(1H1, 40X, 16HDIGITAL FUSELAGE, /, 20A4)	GLM	166	443
D	GO TO 30	VORTWON	444	

APPENDIX F
SOURCE LISTING OF MODIFIED PROGRAM VORTWD

PROGRAM VORTWON 74/74 OPT-1

FTN 4.6+452

78/04/21. 11.08.92

1	PROGRAM VORTWON(INPUT,OUTPUT,TAPE99=INPUT,TAPE6=OUTPUT,TAPE5,	VORTWON	1
	1 TAPE3,TAPE4)	GLM	1
	CONTROL*VRLX,VORTWON	9/29/76 VORTWON	3
	C...	VORTWON	4
5	C...PROGRAM TO CONVERT DATA FROM VORLAX PROGRAM OUTPUT INTO	VORTWON	5
	C...WAVEOPAG INPUT. THERE ARE MANY RESTRICTIONS IN THIS CONVERSION	VORTWON	6
	C...AND THE USERS GUIDE SHOULD BE CONSULTED FOR AN EXPLANATION.	VORTWON	7
	C...	VORTWON	8
	C...THIS PROGRAM HAS BEEN MODIFIED BY G. L. MARTIN (KENTRON) TO	GLM	2
10	C...INCORPORATE MULTIELEMENT FUSELAGES AND PLOT THE MAJOR VORLAX PANELS	GLM	3
	C...AUTOMATICALLY EACH TIME THE PROGRAM IS RUN. FOR INFORMATION	GLM	4
	C...CONCERNING THIS PROGRAM AND ITS CURRENT STATUS CONTACT H. HEYSON	GLM	5
	C...(NASA LANGLEY)	GLM	6
	C...	GLM	7
15	DIMENSION NWING (20), II (24), NAPX (40), XYZC2 (4, 40),	VORTWON	9
	* ZC12 (2, 30, 40), XAFX (30, 40), NFUSE (6), YFUS (6, 30),	VORTWON	10
	* 7FUS (6, 30), YFUS (4, 30), ABCD (6, 2, 4), NFPAN (6), XFIN (10),	GLM	8
	* FINORD(10), XCAN(10), CANORD(10), NCANP(2), NPPAN(9), RHO(20),	VORTWON	12
	* PODORG (9,3), HPP (20), XPOD (9,10), PODORD (9,10)	GLM	9
20	DIMENSION XAF (50), ZC1 (50), ZC2 (50), AFUS (4, 30), 7FUSS (4,30)	GLM	10
	DIMENSION DESCRP (10), ALPHA (8), PHI (20, 6), RO (51), CURV (40),	GLM	11
	* TITLE (20), XS (20), C1 (20), C2 (20)	VORTWON	16
	DIMENSION YFUSD (4, 101, 6), ZFUSD (4, 101, 6), DEFG (6, 2, 4),	GLM	12
	* XFUSD (4, 101), ZCSUB (3), XSUB (3), NXFUS (4)	GLM	13
25	REAL MACH, NVOR, LESWP	VORTWON	17
	COMMON /SET4 /AINC1 (20), AINC2 (20)	VORTWON	18
	COMMON /SET5 /XAPEY (40), YAPEX (40), ZAPEX (40), PDL (40),	VORTWON	19
	* LESWP (40), SYNTH (40), IQUANT (40)	VORTWON	20
	COMMON /SET7 /RNCV (20), ITS (20)	VORTWON	21
30	COMMON /SET12 /CSTART (40), TAPER (40), PSPAN (40), NVOR (40)	VORTWON	22
	COMMON /SET13 /MACH (8)	VORTWON	23
	COMMON /SET23 /SLE1 (20), SLE2 (20), SPC (40)	VORTWON	24
	NAMELIST/INPUT/NWNGP, NWING, NFUSP, NFUSE, NF, NFPAN, NCAN, NCANP	VORTWON	25
	*, PLOTSZ, NP, NPPAN	VORTWON	26
35	10 FORMAT (20A4)	VORTWON	27
	20 FORMAT (1H1, 20A4)	VORTWON	28
	CALL TRANS	VORTWON	29
	CALL LSTDTB	VORTWON	30
	PI = 3.14159	VORTWON	31
40	30 L3 = 3	VORTWON	32
	DO 40 I = 1, 10	VORTWON	33
	XFIN (I) = 0.	VORTWON	34

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PROGRAM VORTWON 74/74 OPT=1

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	FINORD (I) = 0.	VORTWON	35
	XCAN (I) = 0.	VORTWON	36
45	CANORD (I) = 0.	VORTWON	37
	DO 35 M = 1, 4	GLH	14
35	IF (I .LE. 6) XFUS (M, I) = 0.	GLH	15
40	CONTINUE	VORTWON	39
	DO 50 I = 1, 30	VORTWON	40
50	DO 50 J = 1, 6	VORTWON	41
	DO 45 M = 1, 4	GLH	16
45	XFUS (M, I) = 0.	GLH	17
	AFUS (I) = 0.	VORTWON	43
	YFUS (J, I) = 0.	VORTWON	44
55	ZFUS (J, I) = 0.	VORTWON	45
50	CONTINUE	VORTWON	46
	DO 60 I = 1, 6	VORTWON	47
	DO 60 J = 1, 2	VORTWON	48
	DO 60 K = 1, 4	VORTWON	49
60	ABCD (I, J, K) = 0.	VORTWON	50
60	CONTINUE	VORTWON	51
	DO 70 I = 1, 2	VORTWON	52
	DO 70 J = 1, 30	VORTWON	53
	DO 70 K = 1, 40	VORTWON	54
65	ZC12 (I, J, K) = 0.	VORTWON	55
70	CONTINUE	VORTWON	56
	DO 75 I = 1, 24	GLH	13
	II (I) = 0	GLH	19
75	CONTINUE	GLH	20
70	NWNGP = 0	VORTWON	57
	NF = 0	VORTWON	58
	NCAN = 0	VORTWON	59
	NFUSP = 0	VORTWON	60
	DTR = .017453	VORTWON	61
75	PLNTSZ = 10.	VORTWON	62
	READ (5, INPUT)	VORTWON	63
	IF (EOF (5)) 940, 76	GLH	21
76	READ (5, 10) TITLE	GLH	22
	WRITE (13, 10) TITLE	VORTWON	66
90	READ (5, 80) ISOLV, LAX, LAY, REXPAR, HAG, FLOATX, FLOATY, ITRMAX	VORTWON	67
80	FORMAT (3 (I2, 8X), 4F10.0, 7X, I3)	VORTWON	68
	READ (5, 90) NMACH, (MACH (I), I = 1, NMACH)	VORTWON	69
90	FORMAT (12, 8X, 7F10.0)	VORTWON	70
	WRITE (4, 20) TITLE	VORTWON	71

85	READ (5, 90) NALPHA, (ALPHA (1), 1 = 1, NALPHA)	VORTWON	72
	READ (5, 90) LATRAL, PSI, PITCHQ, ROLLO, YAWQ, VINP	VORTWON	73
	IF (PSI .NE. 0.) LATRAL = 1	VORTWON	74
	IF (ROLLO .NE. 0.) LATRAL = 1	VORTWON	75
	IF (YAWQ .NE. 0.) LATRAL = 1	VORTWON	76
90	IF (VINP .LE. 0.001) VINP = 1.0	VORTWON	77
	READ (5, 100) NPAN, SREF, CBAR, XBAR, ZBAR, WSPAN	VORTWON	78
100	FORMAT (I2, 8X, 5F10.0)	VORTWON	79
	IF (WSPAN .LE. 0.0001) WSPAN = 2.0	VORTWON	80
	C	VORTWON	81
95	110 FORMAT (8F10.0)	VORTWON	82
	INVERS = 0	VORTWON	83
	DO 200 I = 1, NPAN	VORTWON	84
	READ (5, 120) X1, Y1, Z1, CORD1, DESCRP	VORTWON	85
	READ (5, 120) X2, Y2, Z2, CORD2, DESCRP	VORTWON	86
100	XYZC2 (1, I) = X2	VORTWON	87
	XYZC2 (2, I) = Y2	VORTWON	88
	XYZC2 (3, I) = Z2	VORTWON	89
	XYZC2 (4, I) = CORD2	VORTWON	90
	READ (5, 120) NVOR (I), RNCV (I), SPC (I), CURV (I), DESCRP	VORTWON	91
105	PDL (I) = 0.	VORTWON	92
	IF (CURV (I) .NE. 0.) PDL (I) = 999.	VORTWON	93
	IF (CUPV (I) .GT. 500.0) CURV (I) = 0.0	VORTWON	94
	120 FORMAT (4F10.0, 10A4)	VORTWON	95
	INTRAC = 1	VORTWON	96
110	IF (PDL (I) .EQ. 0.) INTRAC = 0	VORTWON	97
	XAPEX (I) = X1	VORTWON	98
	YAPEX (I) = Y1	VORTWON	99
	ZAPEX (I) = Z1	VORTWON	100
	CSTART (I) = CORD1	VORTWON	101
115	DELTAY = Y2 - Y1	VORTWON	102
	DELTAZ = Z2 - Z1	VORTWON	103
	IF (INTRAC .EQ. 0) PDL (I) = 1./OTR *ATAN2 (DELTAZ, DELTAY)	VORTWON	104
	IF (INTRAC .EQ. 0) GO TO 150	VORTWON	105
	NV = NVOR (I)	VORTWON	106
120	IBOT = 1	VORTWON	107
	IF (I .EQ. 1) GO TO 140	VORTWON	108
	ITOP = I - 1	VORTWON	109
	DO 130 J = 1, ITOP	VORTWON	110
	INV = NVOR (J)	VORTWON	111
125	IBOT = IBOT + INV	VORTWON	112
	130 CONTINUE	VORTWON	113

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140	ITOP = IROT + NV - 1	VORTWON	114
	JJTOP = NVOR (I) + 1	VORTWON	115
	READ (5, 110) (PHI (I, JJ), RU (JJ), JJ = 1, JJTOP)	GLM	23
130	RHO (I) = RU (I)	VORTWON	118
150	READ (5, 140) AINC1 (I), AINC2 (I), ITS (I), NAP, IOWANT(I),	VORTWON	119
	* ISYNT, NPP (I)	VORTWON	120
	NAPX (I) = NAP	VORTWON	121
160	FORMAT (2F10.0, 5 (I2, 8X))	VORTWON	122
135	SYNT (I) = ISYNT	VORTWON	123
	MAX = RNCV (I)	VORTWON	124
	IF (ISYNT .EQ. 0) GO TO 170	VORTWON	125
	READ (5, 110) (C1 (K), K = 1, MAX)	VORTWON	126
	READ (5, 110) (C2 (K), K = 1, MAX)	VORTWON	127
140	INVERS = 1	VORTWON	128
	SLE1 (I) = 0.	VORTWON	129
	SLE2 (I) = 0.	VORTWON	130
	GO TO 200	VORTWON	131
170	IF (NAP .LT. 3) GO TO 200	VORTWON	132
145	ILE = ITS (I) * (1 - INTRAC)	VORTWON	133
	RLE1 = 0.0	VORTWON	134
	RLE2 = 0.0	VORTWON	135
	READ (5, 110) (XAF (JJ), JJ = 1, NAP)	VORTWON	136
	DO 180 JJ = 1, NAP	VORTWON	137
150	180 XAFX (JJ, I) = XAF (JJ)	VORTWON	138
	IF (ILE .NE. 0) READ (5, 110) RLE1	VORTWON	139
	READ (5, 110) (ZC1 (JJ), JJ = 1, NAP)	VORTWON	140
	IF (ILE .NE. 0) READ (5, 110) RLE2	VORTWON	141
	READ (5, 110) (ZC2 (JJ), JJ = 1, NAP)	VORTWON	142
155	DO 190 JJ = 1, NAP	VORTWON	143
	ZC12 (1, JJ, I) = ZC1 (JJ)	VORTWON	144
190	ZC12 (2, JJ, I) = ZC2 (JJ)	VORTWON	145
200	CONTINUE	VORTWON	146
	READ (5, 210) NX5, NYS, NZ5	VORTWON	147
160	210 FORMAT (3 (I2, 8X))	VORTWON	148
	IF (NX5 .GT. 0) READ (5, 110) (XS (I), I = 1, NX5)	VORTWON	149
	IF (NX5 .GT. 0) READ (5, 110) YNOT, DELTAY, ZNST, DELTAZ	VORTWON	150
	DO 220 I = 1, 24	VORTWON	151
	II (I) = 0	VORTWON	152
145	220 CONTINUE	VORTWON	153
	II (1) = 1	VORTWON	154
	IF (NWNGP .GT. 0) II (2) = 1	VORTWON	155
	IF (NWNGP .GT. 0) NAP = NAPX (NWING (1))	VORTWON	156

	IF (NFUSP .GT. 0) II (3) = 1	VORTWON	157
170	IF (PDL (NFUSE (1)) .GT. 360.) II (3) = -1	VORTWON	158
	IF (NWNGP .GT. 0) II (8) = NWNGP + 1	VORTWON	159
	II (10) = NFUSP	GLH	24
	IF (NFUSP .EQ. 0) GO TO 230	VORTWON	161
	IB = NFUSE (1)	VORTWON	162
175	IF (PDL (IB) .EQ. 0) II (11) = 3	VORTWON	163
	IF (PDL (IB) .GT. 360.) II (11) = NVOR (IB) + 1	VORTWON	164
	ITNOSE = 0	VORTWON	165
	ITAFT = 0	VORTWON	166
	IF (ABS ((XYZC2 (1, IB) - XAPEX (IB))) .GE. .01) ITNOSE = 1	VORTWON	167
180	IF (ABS ((XYZC2 (1, IB) + XYZC2 (4, IB)) - (XAPEX (IB) + CSTART (IB))) .GE. .01)	VORTWON	168
	* ITAFT = 1	VORTWON	169
230	IF (NWNGP .GT. 0) II (9) = NAP	VORTWON	170
	IF (NAPX (NWING (1)) .EQ. 0) II (9) = 2	VORTWON	171
	IF (II (9) .EQ. 2) NAP = 2	VORTWON	172
185	IF (NFUSP .GT. 0 .AND. PDL (IB) .LT. 360.) II (12) = 2 + ITNOSE + ITAFT	VORTWON	173
	IF (II (10) .GE. 2) II (13) = II (11)	GLH	25
	IF (II (10) .GE. 3) II (15) = II (11)	GLH	26
	IF (II (10) .GE. 4) II (17) = II (11)	GLH	27
	IF (PDL (IB) .GT. 360.) II (12) = NAPX (IB)	VORTWON	174
190	IF (NF .GT. 0) II (5) = 1	VORTWON	175
	II (21) = NF	VORTWON	176
	IF (NF .GT. 0) II (22) = 2	VORTWON	177
	IF (NCAN .GT. 0) II (6) = 1	VORTWON	178
	II (23) = NCAN	VORTWON	179
195	IF (NCAN .GT. 0) II (24) = 2	VORTWON	180
	IF (NP .GT. 0) II (4) = 1	VORTWON	181
	II (19) = NP	VORTWON	182
	NPODOR = NAPX (NPPAN (1))	VORTWON	183
	II (20) = NPODOR	VORTWON	184
200	DO 235 L = 1, 4	GLH	28
	NXFUS (L) = NAPX (NFUSE (L))	GLH	29
235	CONTINUE	GLH	30
	II (12) = NXFUS (1)	GLH	31
	II (14) = NXFUS (2)	GLH	32
205	II (16) = NXFUS (3)	GLH	33
	II (18) = NXFUS (4)	GLH	34
	WRITE (L3, 480) II	VORTWON	185
	WRITE (6, 610) II	VORTWON	186
	ISREF = SREF	VORTWON	187
210	WRITE (L3, 490) ISREF	VORTWON	188

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	WRITE (6, 620) ISREF	VORTWON	189
	IF (NWNGP .EQ. 0) GO TO 290	VORTWON	190
	IF (II (9) .NE. 2) GO TO 240	VORTWON	191
	XAFX (1, NWING (1)) = 0.	VORTWON	192
215	XAFX (2, NWING (1)) = 100.	VORTWON	193
	240 WRITE (L3, 500) (XAFX (JJ, NWING (1)), JJ = 1, NAP)	VORTWON	194
	WRITE (6, 630) (XAFX (JJ, NWING (1)), JJ = 1, NAP)	VORTWON	195
	DO 250 I = 1, NWNGP	VORTWON	196
	IW = NWING (I)	VORTWON	197
220	WRITE (6, 640) XAPEX (IW), YAPEX (IW), ZAPEX (IW), CSTART (IW)	VORTWON	198
	250 WRITE (L3, 510) XAPEX (IW), YAPEX (IW), ZAPEX (IW), CSTART (IW)	VORTWON	199
	IWT = NWING (NWNGP)	VORTWON	200
	WRITE (L3, 510) (XYZC2 (I, IWT), I = 1, 4)	VORTWON	201
	WRITE (6, 640) (XYZC2 (I, IWT), I = 1, 4)	VORTWON	202
225	ZERO = 0.	VORTWON	203
	DO 270 I = 1, NWNGP	VORTWON	204
	IW = NWING (I)	VORTWON	205
	DO 260 JJ = 1, NAP	VORTWON	206
	ZC12 (1, JJ, IW) = ZC12 (1, JJ, IW) * CSTART (IW) / 100.	VORTWON	207
230	ZC12 (2, JJ, IW) = ZC12 (2, JJ, IW) * XYZC2 (4, IW) / 100.	VORTWON	208
	260 CONTINUE	VORTWON	209
	WRITE (L3, 520) (ZC12 (1, JJ, IW), JJ = 1, NAP)	VORTWON	210
	WRITE (6, 650) (ZC12 (1, JJ, IW), JJ = 1, NAP)	VORTWON	211
	270 CONTINUE	VORTWON	212
235	WRITE (L3, 520) (ZC12 (2, JJ, IW), JJ = 1, NAP)	VORTWON	213
	WRITE (6, 650) (ZC12 (2, JJ, IW), JJ = 1, NAP)	VORTWON	214
	NWNGP1 = NWNGP + 1	VORTWON	215
	DO 280 I = 1, NWNGP1	VORTWON	216
	WRITE (6, 660) (ZERO, JJ = 1, NAP)	VORTWON	217
240	WRITE (L3, 530) (ZERO, JJ = 1, NAP)	VORTWON	218
	280 CONTINUE	VORTWON	219
	C	VORTWON	220
	C GETTING THE X VALUES FOR THE FUSELAGE	VORTWON	221
	C	VORTWON	222
245	290 NFORX = II (12)	VORTWON	223
	IF (NFUSP .EQ. 0) GO TO 370	VORTWON	224
	IR = NFUSE (1)	VORTWON	225
	IF (PDL (IR) .GT. 360.) GO TO 330	VORTWON	226
	C	GLM	35
250	C FLAT FUSELAGE	GLM	36
	C	GLM	37
	I = 1	GLM	38

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255      IA = NFUSE (I)
          XFUS (1, 1) = XAPEX (IB)
          XFEND = XYZC2 (1, IB) + XYZC2 (4, IB)
          IF (ITNOSE .GT. 0 .AND. ITAFT .GT. 0) XFUS (1, 3) = XFEND
          IF (ITNOSE .EQ. 0 .AND. ITAFT .GT. 0) XFUS (1, 2) = XFEND
          XFUS (1, NFORX) = XAPEX (IB) + CSTART (IB)
          NWDS = NFORX
260      IF (NFORX .LT. 6) NWDS = 6
          WRITE (L3,540) (XFUS (I, JJ), JJ = 1, NWDS)
          WRITE (6, 670) (XFUS (I, JJ), JJ = 1, NWDS)

C
C   GETTING THE Y ^ Z VALUES FOR THE FUSELAGE
C
265      YFUS (1, 1) = YAPEX (IB)
          YFUS (1, 2) = XYZC2 (2, IB)
          IF (ITNOSE .GT. 0) YFUS (1, 2) = YAPEX (IB)
          YFUS (1, 3) = YAPEX (IB)
270      ZFUS (1, 1) = ZAPEX (IB)
          ZFUS (1, 2) = XYZC2 (3, IB)
          IF (ITNOSE .GT. 0) ZFUS (1, 2) = ZAPEX (IB)
          ZFUS (1, 3) = ZAPEX (IB)
          IF (ITNOSE .EQ. 0) GO TO 300
275      YFUS (2, 1) = YAPEX (IB)
          YFUS (2, 2) = XYZC2 (2, IB)
          YFUS (2, 3) = YAPEX (IB)
          ZFUS (2, 1) = ZAPEX (IB)
          ZFUS (2, 2) = XYZC2 (3, IB)
280      ZFUS (2, 3) = ZAPEX (IB)
          IF (ITAFT .EQ. 0) GO TO 310
300      YFUS (3, 1) = YAPEX (IB)
          YFUS (3, 2) = XYZC2 (2, IB)
          YFUS (3, 3) = YAPEX (IB)
285      ZFUS (3, 1) = ZAPEX (IB)
          ZFUS (3, 2) = XYZC2 (3, IB)
          ZFUS (3, 3) = ZAPEX (IB)
310      CONTINUE
          YFUS (NFORX, 1) = YAPEX (IB)
          YFUS (NFORX, 2) = XYZC2 (2, IB)
          IF (ITAFT .GT. 0) YFUS (NFORX, 2) = YAPEX (IB)
          YFUS (NFORX, 3) = YAPEX (IB)
          ZFUS (NFORX, 1) = ZAPEX (IB)
          ZFUS (NFORX, 2) = XYZC2 (3, IB)

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GLM      39
GLM      40
VORTWON  229
GLM      41
GLM      42
GLM      43
VORTWON  233
VORTWON  234
GLM      44
GLM      45
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295	IF (ITART .GT. 0) ZFUS (NFORX, 2) = ZAPEX (IB)	VORTWON	269
	ZFUS (NFORX, 3) = ZAPEX (IB)	VORTWON	270
	DO 320 I = 1, NFORX	VORTWON	271
	NRADX = IT (I)	VORTWON	272
	NWDS = NRADX	VORTWON	273
300	IF (NRADX .LT. 10) NWDS = 10	VORTWON	274
	WRITE (L3, 560) (YFUS (I, JJ), JJ = 1, NWDS)	VORTWON	275
	WRITE (6, 690) (YFUS (I, JJ), JJ = 1, NWDS)	VORTWON	276
	WRITE (L3, 570) (ZFUS (I, JJ), JJ = 1, NWDS)	VORTWON	277
	WRITE (6, 700) (ZFUS (I, JJ), JJ = 1, NWDS)	VORTWON	278
305	320 CONTINUE	VORTWON	279
	GO TO 370	VORTWON	280
	C	VORTWON	281
	C TREATMENT OF CURVED PANEL FUSELAGE	VORTWON	282
	C GETTING X VALUES OF FUSELAGE	VORTWON	283
310	C	VORTWON	284
	330 DO 345 I = 1, NFUSP	GLH	46
	IB = NFUSE (I)	GLH	47
	NB = NXFUS (I)	GLH	48
	DO 340 JJ = 1, NB	GLH	49
315	XFUS (I, JJ) = XAFX (JJ, IB) * CSTART (IB) / 100. + XAPEX (IB)	GLH	50
	340 CONTINUE	VORTWON	288
	IF (NAPX (IB) .GE. 3) GO TO 341	GLH	51
	XFUS (I, 1) = XAPEX (IB)	GLH	52
	XFUS (I, 2) = XAPEX (IB) + CSTART (IB)	GLH	53
320	341 CONTINUE	GLH	54
	WRITE (L3, 550) (XFUS (I, JJ), JJ = 1, NB)	GLH	55
	WRITE (6, 680) (XFUS (I, JJ), JJ = 1, NB)	GLH	56
	C	VORTWON	291
	C GETTING THE FUSELAGE CAMBER LINE	VORTWON	292
325	C	VORTWON	293
	ZRATIO = 0.	VORTWON	294
	IF (NPP (IB) .GT. 0) ZRATIO = 1.0	VORTWON	295
	DO 350 JJ = 1, NB	GLH	57
	ZFUSS (I, JJ) = ZC12 (I, JJ, IB) * ZRATIO * CSTART (IB) / 100.	GLH	58
330	350 CONTINUE	VORTWON	298
	WRITE (L3, 900) (ZFUSS (I, JJ), JJ = 1, NB)	GLH	59
	WRITE (6, 910) (ZFUSS (I, JJ), JJ = 1, NB)	GLH	60
	C	VORTWON	301
	C GETTING THE FUSELAGE CROSS-SECTIONAL AREAS, AFUS	VORTWON	302
335	C EACH VORLAX CROSS SECTION IS ASSUMED HAVE A CONSTANT RADIUS	VORTWON	303
	C	VORTWON	304

PROGRAM VORTWON

74/74

OPT=1

FTN 4.6+497

78/04/21. 11.08.52

	DO 360 JJ = 1, NB	GLM	61
	IF (NPP (IR) .GT. 0) ARATIO = ZC12 (2, JJ, IB) /100.	VORTWON	306
	IF (NPP (IR) .EQ. 0) ARATIO = 1.	VORTWON	307
340	AFUS (I, JJ) = ARATIO * PI * RHO (IB) ** 2	GLM	62
	IF (NAPX (IR) .GE. 3) GO TO 352	GLM	63
	AFUS (I, 1) = PI * RHO (IB) ** 2	GLM	64
	AFUS (I, 2) = AFUS (I, 1)	GLM	65
	ARATIO = 1.0	GLM	66
345	352 CONTINUE	GLM	67
	DO 351 JD=1,5	GLM	68
	IO = I	GLM	69
	XFUSD (IO, JJ) = XFUS (I, JJ)	GLM	70
	NO = NFUSE (I)	GLM	71
350	ZFWLE = ZAPEX (NO) - RHO (NO)	GLM	72
	YFUSD (IO, JJ, JD) = SORT (ARATIO) * RHO (NO) * COS (PHT (NO, JD)	GLM	73
	* * DTR)	GLM	74
	ZFUSD (IO, JJ, JD) = SORT (ARATIO) * RHO (NO) * SIN (PHT (NO, JD)	GLM	75
	* * DTR) + ZFWLE	GLM	76
355	351 CONTINUE	GLM	77
	360 CONTINUE	VORTWON	309
	WRITE (L3, 920) (AFUS (I, JJ), JJ = 1, NB)	GLM	78
	WRITE (6, 930) (AFUS (I, JJ), JJ = 1, NB)	GLM	79
	365 CONTINUE	GLM	80
360	C	VORTWON	312
	C SETTING UP FOR NACELLES	VORTWON	313
	C	VORTWON	314
	370 IF (II (19) .EQ. 0) GO TO 410	VORTWON	315
	DO 400 JK = 1, NP	VORTWON	316
365	NW = NPPAN (JK)	VORTWON	317
	PDDORG (JK, 1) = XAPEX (NW)	GLM	81
	PDDORG (JK, 2) = YAPEX (NW)	GLM	82
	PDDORG (JK, 3) = ZAPEX (NW) - RHO (NW)	GLM	83
	WRITE (L3, 840) ((PDDORG (JK, KL), KL = 1, 3), JK)	GLM	84
370	WRITE (6, 850) ((PDDORG (JK, KL), KL = 1, 3), JK)	GLM	85
	DO 380 KK = 1, 10	VORTWON	323
	XPDD (JK, KK) = 0.	VORTWON	324
	IF (KK .GT. NPDDOR) GO TO 380	VORTWON	325
	XPDD (JK, KK) = XAFX (KK, NW) * CSTART (NW) /100.	VORTWON	326
375	380 CONTINUE	VORTWON	327
	WRITE (L3, 860) (XPDD (JK, KK), KK = 1, 10), JK	VORTWON	328
	WRITE (6, 870) (XPDD (JK, KK), KK = 1, 10), JK	VORTWON	329
	DO 390 KK = 1, 10	VORTWON	330

PROGRAM VORTWON 74/74 OPT=1

FTN 4.6+452

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	PODORD (JK, KK) = 0.	VORTWON	331
380	IF (KK .GT. NPOORD) GO TO 390	VORTWON	332
	PODORD (JK, KK) = ZC12 (2, KK, NW)	VORTWON	333
	IF (NPP(NW).NE.0) PODORD(JK, KK)=SORT(ZC12(2, KK, NW)/100.)*RHO(NW)	VORTWON	334
390	CONTINUE	VORTWON	335
	WRITE (L3, 880) (PODORD (JK, KK), KK = 1, 10), JK	VORTWON	336
395	WRITE (4, 890) (PODORD (JK, KK), KK = 1, 10), JK	VORTWON	337
400	CONTINUE	VORTWON	338
C		VORTWON	339
C	SETTING UP FOR FINS	VORTWON	340
C		VORTWON	341
410	IF (NF .EQ. 0) GO TO 440	VORTWON	342
	DO 420 NN = 1, NF	VORTWON	343
	IR = NFPAV (NN)	VORTWON	344
	ABCD (NN, 1, 1) = XAPEX (IB)	VORTWON	345
	ABCD (NN, 1, 2) = YAPEX (IB)	VORTWON	346
395	ABCD (NN, 1, 3) = ZAPEX (IB)	VORTWON	347
	ABCD (NN, 1, 4) = CSTART (IB)	VORTWON	348
	ABCD (NN, 2, 1) = XYZC2 (1, IB)	VORTWON	349
	ABCD (NN, 2, 2) = XYZC2 (2, IB)	VORTWON	350
	ABCD (NN, 2, 3) = XYZC2 (3, IB)	VORTWON	351
400	ABCD (NN, 2, 4) = XYZC2 (4, IB)	VORTWON	352
420	CONTINUE	VORTWON	353
	XFIN (1) = 0.	VORTWON	354
	XFIN (2) = 100.	VORTWON	355
	FINORD (1) = 0.	VORTWON	356
405	FINORD (2) = 0.	VORTWON	357
	DO 430 NN = 1, NF	VORTWON	358
	WRITE (6, 710) ((ABCD (NN, I, J), J = 1, 4), I = 1, 2)	VORTWON	359
	WRITE (L3, 580) ((ABCD (NN, I, J), J = 1, 4), I = 1, 2)	VORTWON	360
	WRITE (L3, 590) (XFIN (I), I = 1, 2)	VORTWON	361
410	WRITE (6, 720) (XFIN (I), I = 1, 2)	VORTWON	362
	WRITE (L3, 600) (FINORD (I), I = 1, 2)	VORTWON	363
	WRITE (6, 730) (FINORD (I), I = 1, 2)	VORTWON	364
	DO 425 I = 1, 2	GLH	86
	DO 425 J = 1, 4	GLH	87
415	DEFG(NN, I, J) = ABCD(NN, I, J)	GLH	88
425	CONTINUE	GLH	89
430	CONTINUE	VORTWON	365
C		VORTWON	366
C	SETTING UP FOR CANARDS	VORTWON	367
C		VORTWON	368
420			

440	IF (NCAN .EQ. 0) GO TO 470	VORTWDN	369
	DO 450 NN = 1, NCAN	VORTWDN	370
	IR = NCAMP (NN)	VORTWDN	371
	ABCD (NN, 1, 1) = XAPEX (IB)	VORTWDN	372
425	ABCD (NN, 1, 2) = YAPEX (IB)	VORTWDN	373
	ABCD (NN, 1, 3) = ZAPEX (IB)	VORTWDN	374
	ABCD (NN, 1, 4) = CSTART (IB)	VORTWDN	375
	ABCD (NN, 2, 1) = XYZC2 (1, IB)	VORTWDN	376
	ABCD (NN, 2, 2) = XYZC2 (2, IB)	VORTWDN	377
430	ABCD (NN, 2, 3) = XYZC2 (3, IB)	VORTWDN	378
	ABCD (NN, 2, 4) = XYZC2 (4, IB)	VORTWDN	379
450	CONTINUE	VORTWDN	380
	XCAN (1) = 0.	VORTWDN	381
	XCAN (2) = 100.	VORTWDN	382
435	CANORD (1) = 0.	VORTWDN	383
	CANORD (2) = 0.	VORTWDN	384
	DO 460 NN = 1, NCAN	VORTWDN	385
	WRITE (6, 750) ((ABCD (NN, I, J), J = 1, 4), I = 1, 2)	VORTWDN	386
	WRITE (13, 740) ((ABCD (NN, I, J), J = 1, 4), I = 1, 2)	VORTWDN	387
440	WRITE (13, 760) (XCAN (I), I = 1, 2)	VORTWDN	388
	WRITE (6, 770) (XCAN (I), I = 1, 2)	VORTWDN	389
	WRITE (13, 780) (CANORD (I), I = 1, 2)	VORTWDN	390
	WRITE (6, 790) (CANORD (I), I = 1, 2)	VORTWDN	391
460	CONTINUE	VORTWDN	392
445	470 CONTINUE	GLM	90
	C	GLM	91
	C WRITE OUT AND PLOT THE VORLAX MAJOR PANEL GEOMETRY	GLM	92
	C	GLM	93
	L4=4	GLM	94
450	II (3) = 1	GLM	95
	II (9) = 2	GLM	96
	WRITE(14,10)TITLE	GLM	97
	WRITE(6,950) TITLE	GLM	98
	WRITE(14,480)III	GLM	99
455	WRITE(6, 610)II	GLM	100
	WRITE(14,490)ISREF	GLM	101
	WRITE(6, 620)ISREF	GLM	102
	IF (II(8) .EQ. 0) GO TO 462	GLM	103
	XSUB (1) = 0.0	GLM	104
460	XSUB (2) = 100.0	GLM	105
	WRITE(14,500) (XSUB (JJ), JJ = 1, 2)	GLM	106
	WRITE(6, 630) (XSUB (JJ), JJ = 1, 2)	GLM	107

PROGRAM VORTWON

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OPT=1

FTN 4.4+452

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	DO 451 I = 1, NWNGP	GLH	108
	IW = NWING (I)	GLH	109
465	WRITE(14,510) XAPEX (IW), YAPEX (IW), ZAPEX (IW), CSTART (IW)	GLH	110
	WRITE(6, 640) XAPEX (IW), YAPEX (IW), ZAPEX (IW), CSTART (IW)	GLH	111
451	CONTINUE	GLH	112
	IWT = NWING (NWNGP)	GLH	113
	WRITE(14,510) (XYZC2 (I, IWT), I = 1, 4)	GLH	114
470	WRITE(6, 640) (XYZC2 (I, IWT), I = 1, 4)	GLH	115
	NWNGP1=NWNGP+1	GLH	116
	DO 452 I = 1, NWNGP1	GLH	117
	WRITE(14,520) (ZERO, JJ = 1, 2)	GLH	118
	WRITE(6, 650) (ZERO, JJ = 1, 2)	GLH	119
475	452 CONTINUE	GLH	120
	DO 453 I = 1, NWNGP1	GLH	121
	WRITE(14,530) (ZERO, JJ = 1, 2)	GLH	122
	WRITE(6, 660) (ZERO, JJ = 1, 2)	GLH	123
	453 CONTINUE	GLH	124
480	462 IF (II (10) .EQ. 0) GO TO 464	GLH	125
	IPWQ = II(10)	GLH	126
	DO 454 IO = 1, IPWQ	GLH	127
	NFORX = NXFUS (IO)	GLH	128
	WRITE(14,550) (XFUSD (IO, JO), JO = 1, NFORX)	GLH	129
485	WRITE(6, 680) (XFUSD (IO, JO), JO = 1, NFORX)	GLH	130
	DO 458 JO = 1, NFORX	GLH	131
	WRITE(14,560) (YFUSD (IO, JO, KQ), KQ = 1, 5)	GLH	132
	WRITE(6, 690) (YFUSD (IO, JO, KQ), KQ = 1, 5)	GLH	133
	WRITE(14,570) (ZFUSD (IO, JO, KQ), KQ = 1, 5)	GLH	134
490	WRITE(6, 700) (ZFUSD (IO, JO, KQ), KQ = 1, 5)	GLH	135
	458 CONTINUE	GLH	136
	454 CONTINUE	GLH	137
	464 IF (II (19) .EQ. 0) GO TO 466	GLH	138
	DO 455 JK = 1, NP	GLH	139
495	WRITE(14,840) (PODORG (JK, KL), KL = 1, 3), JK	GLH	140
	WRITE(6, 850) (PODORG (JK, KL), KL = 1, 3), JK	GLH	141
	WRITE(14,860) (XPOD (JK, KK), KK = 1, 10), JK	GLH	142
	WRITE(6, 870) (XPOD (JK, KK), KK = 1, 10), JK	GLH	143
	WRITE(14,880) (PODORD (JK, KK), KK = 1, 10), JK	GLH	144
500	WRITE(6, 890) (PODORD (JK, KK), KK = 1, 10), JK	GLH	145
	455 CONTINUE	GLH	146
	466 IF (II (21) .EQ. 0) GO TO 468	GLH	147
	DO 456 NN = 1, NF	GLH	148
	WRITE(14,580) ((DEFG (NN, I, J), J = 1, 4), I = 1, 2)	GLH	149

PROGRAM VORTWON

74/74

OPT=1

FTN 4.6+452

78/04/21. 11.08.52

505	WRITE(6, 710) ((DEFG(NN, 1, J), J = 1, 4), I = 1, 2)	GLM	150
	WRITE(4, 590) (XFIN (I), I = 1, 2)	GLM	151
	WRITE(6, 720) (XFIN (I), I = 1, 2)	GLM	152
	WRITE(4, 600) (FINORD (I), I = 1, 2)	GLM	153
	WRITE(6, 730) (FINORD (I), I = 1, 2)	GLM	154
510	456 CONTINUE	GLM	155
	468 IF (II (23) .EQ. 0) GO TO 472	GLM	156
	DO 457 NN = 1, NCAN	GLM	157
	WRITE(4, 740) ((ABCD (NN, I, J), J = 1, 4), I = 1, 2)	GLM	158
	WRITE(6, 750) ((ABCD (NN, I, J), J = 1, 4), I = 1, 2)	GLM	159
515	WRITE(4, 760) (XCAN (I), I = 1, 2)	GLM	160
	WRITE(6, 770) (XCAN (I), I = 1, 2)	GLM	161
	WRITE(4, 780) (CANORD (I), I = 1, 2)	GLM	162
	WRITE(6, 790) (CANORD (I), I = 1, 2)	GLM	163
	457 CONTINUE	GLM	164
520	472 CONTINUE	GLM	165
	480 F0RMA7 (24I3)	VORTWON	398
	490 F0RMA7 (I7, 65X, 4HREFA)	VORTWON	399
	500 F0RMA7 (10F7.2, 5H XAF)	VORTWON	400
	510 F0RMA7 (4F7.2, 42X, 6H W0RG)	VORTWON	401
525	520 F0RMA7 (10F7.2, 7H IZ0RD)	VORTWON	402
	530 F0RMA7 (10F7.3, 6H W0RD)	VORTWON	403
	540 F0RMA7 (6F7.2, 28X, 6H XFUS)	VORTWON	404
	550 F0RMA7 (10F7.2, 6H XFUS)	VORTWON	405
	560 F0RMA7 (10F7.2, 6H YFUS)	VORTWON	406
530	570 F0RMA7 (10F7.2, 6H ZFUS)	VORTWON	407
	580 F0RMA7 (8F7.1, 14X, 8H FIN0RG)	VORTWON	408
	590 F0RMA7 (2F7.1, 56X, 6H XFIN)	VORTWON	409
	600 F0RMA7 (2F7.1, 56X, 8H FIN0RD)	VORTWON	410
	610 F0RMA7 (1H , 24I3)	VORTWON	411
535	620 F0RMA7 (1H , I7, 65X, 4HREFA)	VORTWON	412
	630 F0RMA7 (1H , 10F7.2, 5H XAF)	VORTWON	413
	640 F0RMA7 (1H , 4F7.2, 42X, 6H W0RG)	VORTWON	414
	650 F0RMA7 (1H , 10F7.2, 7H IZ0RD)	VORTWON	415
	660 F0RMA7 (1H , 10F7.3, 6H W0RD)	VORTWON	416
540	670 F0RMA7 (1H , 6F7.2, 28X, 6H XFUS)	VORTWON	417
	680 F0RMA7 (1H , 10F7.2, 6H XFUS)	VORTWON	418
	690 F0RMA7 (1H , 10F7.2, 6H YFUS)	VORTWON	419
	700 F0RMA7 (1H , 10F7.2, 6H ZFUS)	VORTWON	420
	710 F0RMA7 (1H , 8F7.1, 14X, 8H FIN0RG)	VORTWON	421
545	720 F0RMA7 (1H , 2F7.1, 56X, 6H XFIN)	VORTWON	422
	730 F0RMA7 (1H , 2F7.1, 56X, 8H FIN0RD)	VORTWON	423

PROGRAM VORTWON 74/74 OPT=1

FIN 4.6+452

78/04/21. 11.08.52

	740	FORMAT (9F7.1, 14X, 8H CANORG)	VORTWON	424
	750	FORMAT (1H, 8F7.1, 14X, 8H CANORG)	VORTWON	425
	760	FORMAT (7F7.1, 56X, 6H XCAN)	VORTWON	426
550	770	FORMAT (14, 2F7.1, 56X, 6H XCAN)	VORTWON	427
	780	FORMAT (7F7.1, 56X, 8H CANORD)	VORTWON	428
	790	FORMAT (1H, 2F7.1, 56X, 8H CANORD)	VORTWON	429
	840	FORMAT (3F7.2, 51X, 6HPDDORG, 12)	VORTWON	434
	850	FORMAT (1H, 3F7.2, 51X, 6HPDDORG, 12)	VORTWON	435
555	860	FORMAT (10F7.2, 2X, 6HXPDD, 12)	VORTWON	436
	870	FORMAT (1H, 10F7.2, 2X, 6HXPDD, 12)	VORTWON	437
	880	FORMAT (10F7.2, 2X, 6HPDDORD, 12)	VORTWON	438
	890	FORMAT (1H, 10F7.2, 2X, 6HPDDORD, 12)	VORTWON	439
	900	FORMAT (10F7.2, 6H 2FUS)	VORTWON	440
560	910	FORMAT (1H, 10F7.2, 6H 2FUS)	VORTWON	441
	920	FORMAT (10F7.1, 6H AFUS)	VORTWON	442
	930	FORMAT (1H, 10F7.1, 6H AFUS)	VORTWON	443
	950	FORMAT(1H1, 40X, 16HDIGITAL FUSELAGE, /, 20A4)	GLA	166
	940	STOP	VORTWON	445
545		END	VORTWON	446

0-2

SUBROUTINE TRANS

74/74 OPT-1

FTN 4.6+452

78/04/14. 15.41.09

```
1      SUBROUTINE TRANS
      DIMENSION CAPD(8)
10     READ(99, 20) CARD
20     FORMAT(6A10)
      IF(EOF(99) .NE. 0) GO TO 30
      WRITE(5, 20) CARD
      GO TO 10
30     REWIND 5
      RETURN
10     END
```

```
VORTWDN  447
VORTWDN  448
VORTWDN  449
VORTWDN  450
VORTWDN  451
VORTWDN  452
VORTWDN  453
VORTWDN  454
VORTWDN  455
VORTWDN  456
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SUBROUTINE LSTDT8

74/74 OPT=1

FTN 4.6+452

78/04/14. 15.41.09

1	C	SUBROUTINE LSTDT8	VORTWON	457
		DIMENSION A (20)	VORTWON	458
		WRITE (6, 40)	VORTWON	459
5		10 I = 0	VORTWON	460
		20 READ (5, 50) A	VORTWON	461
		IF (20F (5) .NE. 0) GO TO 30	VORTWON	462
		WRITE (6, 80) A	VORTWON	463
		I = I + 1	VORTWON	464
10		IF (I .NE. 44) GO TO 20	VORTWON	465
		WRITE (6, 60)	VORTWON	466
		GO TO 10	VORTWON	467
		30 REWIND 5	VORTWON	468
		WRITE (6, 70)	VORTWON	469
15		RETURN	VORTWON	470
		40 FORMAT (1H1, 26HINPUT DATA LISTING FOLLOWS /14)	VORTWON	471
		50 FORMAT (20A4)	VORTWON	472
		60 FORMAT (1H1)	VORTWON	473
		70 FORMAT (1H0, 17HINPUT DATA LISTED)	VORTWON	474
20		80 FORMAT (1H , 20A4)	VORTWON	475
		END	VORTWON	476
			VORTWON	477

SUBROUTINE LSTDTB

74/74 OPT=1

FIN 4.6+452

78/04/18. 15.44.58

1	C	SUBROUTINE LSTDTB	VORTWON	457
		DIMENSION A (20)	VORTWON	458
		WRITE (6, 40)	VORTWON	459
5	10	I = 0	VORTWON	460
	20	READ (5, 50) A	VORTWON	461
		IF (LOF (5) .NE. 0) GO TO 30	VORTWON	462
		WRITE (6, 60) A	VORTWON	463
		I = I + 1	VORTWON	464
10		IF (I .NE. 44) GO TO 20	VORTWON	465
		WRITE (6, 60)	VORTWON	466
		GO TO 10	VORTWON	467
	30	REWIND 5	VORTWON	468
		WRITE (6, 70)	VORTWON	469
15		RETURN	VORTWON	470
	40	FORMAT (1H1, 26HINPUT DATA LISTING FOLLOWS /1H)	VORTWON	471
	50	FORMAT (20A4)	VORTWON	472
	60	FORMAT (1H1)	VORTWON	473
	70	FORMAT (1H0, 17HINPUT DATA LISTED)	VORTWON	474
20	80	FORMAT (1H , 20A4)	VORTWON	475
		END	VORTWON	476
			VORTWON	477

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